Unit 4 – HOMEWORK PACKET
Equations and Inequalities

Topics

Solving Equations with Rational Coefficients

Solving Two-Step Equations

Writing Equations

More Two-Step Equations

Solving Equations with Variables on Both Sides

Inequalities

Solving Inequalities

Solving Multi-Step Equations and Inequalities

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$x+2=5$
$x=3$

"Just a darn minute — yesterday
you said that X equals two!"

Name:_____

Team:_____ Math Period:_____ Teacher:_____

Lesson 1 Homework Practice

Solving Equations with Rational Coefficients

Solve each equation. Check your solutions.

1. $\frac{7}{8}y = 56$ **2.** $\frac{1}{4}w = 12$ **3.** $-3.5u = -14$ **4.** $-\frac{1}{5}r = 15$

5. $9.1d = -7.28$ **6.** $-\frac{3}{8}f = 0$ **7.** $-\frac{2}{3}n = \frac{1}{3}$ **8.** $\frac{1}{14}v = -7$

9. $-1.5b = 24$ **10.** $-\frac{1}{2}h = -72$ **11.** $\frac{1}{24}r = -5$ **12.** $-\frac{1}{6}p = -3$

13. $-15x = 90$ **14.** $-4.2g = -21$ **15.** $\frac{1}{20}z = -1$ **16.** $\frac{10}{11}t = 0$

17. $23.6g = -94.4$ **18.** $-7d = -28$ **19.** $-\frac{1}{15}m = 7$ **20.** $\frac{7}{9}k = -\frac{7}{9}$

21. $\frac{5}{6}w = 0$ **22.** $-4.8r = 2.4$ **23.** $\frac{1}{12}u = 1$ **24.** $-11q = -99$

25. $\frac{1}{6}y = -\frac{1}{12}$ **26.** $-\frac{1}{8}n = 0$ **27.** $-7.5j = 90$ **28.** $-21p = -231$

29. The product of a number and -6.5 is -58.5. Write and solve an equation to find the number.

30. The quotient of a number and 6 is -14. Write and solve an equation to find the number.

31. Each student needs 12.5 minutes to give a report. A class period is 50 minutes long. Write and solve an equation to determine the number of students who could give a report in one class period.

32. One pound of ground beef makes four hamburger patties. Write and solve an equation to determine how many pounds of beef are needed to make 36 hamburgers.

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Lesson 2 Homework Practice

Solving Two-Step Equations

Solve each equation. Check your solutions.

1. $6p + 22 = 10$

2. $\frac{1}{3}r - 4 = 2$

3. $5d - 9 = -24$

4. $21q - 11 = -210.5$

5. $-\frac{1}{6}v + 1 = 0$

6. $7h + 20 = -8$

7. $\frac{7}{8}k - 40 = -26$

8. $\frac{1}{2}w - 16 = 5$

9. $\frac{1}{4}s - 5 = 1$

10. $\frac{1}{8}x + 7 = 9$

11. $\frac{1}{10}z - 20 = -20$

12. $-\frac{1}{2}r + 11 = 15$

13. $9q + 10 = 20.8$

14. $\frac{1}{5}n - 4 = -10$

15. $6w - 125 = 1$

16. $\frac{1}{3}r - 16 = 2$

17. $9y - 11 - 5y = 25$

18. $20 - \frac{3}{5}d = 29$

19. $-\frac{1}{9}u - 8 = -4$

20. $-6h + 4 - 3 + h = 11$

21. $5p - 4p = 0.5$

22. $18 - \frac{1}{3}x = -7$

23. $21 + 9j - 10 = -277$

24. $12b - 9 + 2b - b = -87$

25. $1 - \frac{1}{9}a - 4 = 0$

26. $4w - w - 26 = 19$

27. $5 - 4y + y - 1 = -23$

28. A furniture rental store charges a down-payment of $100 and $72.50 per month for a table. Hilde paid $535 to rent the table. Solve $72.50n + 100 = 535$ to find the number of months Hilde rented the table.

29. At work, Jack must stuff 1000 envelopes with advertisements. He can stuff 12 envelopes in one minute, and he has 112 envelopes already finished. Solve $1000 = 12n + 112$ to find how many minutes it will take Jack to complete the task.

Lesson 3 Homework Practice
Writing Equations

Translate each sentence into an equation.

1. Eight less than 7.2 times a number is −29.6.

2. Twenty more than twice a number is 52.

3. The difference between one-third of a number and 11 is 10.

4. One increased by the difference between 18 and seven times a number is −9.

5. Eight times a number plus 6 less than twice the number is 34.

6. Twenty-six more than the product of a number and 17 is −42.

7. Twelve less than the quotient of a number and 8 is −1.

Solve each problem by writing and solving an equation.

8. Last summer, Gary trained 32 more dogs than Zina. Together they trained 126 dogs. How many dogs did Gary train?

9. Julius sold five times as many computers as Sam sold last year. In total, they sold 78 computers. How many computers did Julius sell?

10. In one season, Ana ran 18 races. This was four fewer races than twice the number of races Kelly ran. How many races did Kelly run?

11. André hit four more home runs than twice the number of home runs Larry hit. Together they hit 10 home runs. How many home runs did André hit?

12. The sixth grade has collected $116.75 for a local animal shelter. Their goal is to collect $500. They have 3 weeks left. How much money must they collect each week?

Lesson 4 Homework Practice

More Two-Step Equations

Solve each equation.

1. $4(t - 2) = 12$

2. $5(y + 3) = 25$

3. $45 = 9(x - 5)$

4. $42 = 7(p - 13)$

5. $\frac{3}{4}(h + 6) = 15$

6. $\frac{9}{11}(s - 1) = 18$

7. $24 = \frac{6}{7}(k + 8)$

8. $\frac{1}{2}(m + 9) = 6$

9. $0.3(z - 4) = 15$

10. $3.4(x - 12) = 13.6$

11. $\frac{3}{5}(n + 12.6) = 21$

12. $5(d - 3) = 17.5$

13. $7(q + 11) = 63$

14. $54 = \frac{3}{4}(x + 6)$

15. $-2(w - 7) = 16$

16. $5(y + 1) = 14$

17. $-3(x + 8) = -9$

18. $-3(x - 5) = 2$

19. $4(n + 6) = 18$

20. $4.1(t + 1) = 12.3$

21. $-8(k - 3.6) = 36$

Solve each problem by writing and solving an equation.

22. Tyler is going to the movie theater with two of his friends. In addition to purchasing a ticket, each of them also buys a box of popcorn for $5.50. If the total amount the three friends spent altogether is $41.25, then what is the cost for a movie ticket?

23. Jessica purchases 4 of the same type of scented candles, each of which are on sale for $2 off. After the discount was applied, the total cost for the candles is $19.00. What is the regular price of each candle?

Lesson 5 Homework Practice

Solving Equations with Variables on Each Side

Solve each equation. Check your solutions.

1. $3g - 12 = 9g$

2. $14m = 18 + 12m$

3. $7c - 7 = 4c + 17$

4. $-11t = 15 - 6t$

5. $20s + 4 = 13s - 10$

6. $-2h - 16 = 3(h - 2)$

7. $27j - 6 = 14j + 7$

8. $-1 + 19w = 11w + 23$

9. $8 - p = -12 - 3p$

10. $9k - 26 = 6k - 8$

11. $4(7 - d) = 5d - 17$

12. $2y + 7 = y$

13. $11.7 - 2x = x$

14. $3b + 4.4 = 2.6 - 6b$

15. $\frac{3}{4}y - 6 = \frac{1}{4}y + 10$

16. $2c + 7.5 = 6.2 - 3c$

17. $5d - 11 = 2d + 2$

18. $6a - 10 = 2a - 7$

19. $8n - 6 = -9n + 11$

20. $2f - 9 = 14f + 1$

Write an equation to find each number. Then solve.

21. Twice a number is 60 more than five times the number. What is the number?

22. Four times a number is 21 more than the number. What is the number?

23. Eight less than three times a number equals the number. What is the number?

24. A number equals six less than four times a number. What is the number?

25. The area of a tennis court is 2808 ft^2, or 8 square feet more than 3.5 times the size of the area of a racquetball court. What is the area of a raquetball court?

26. One cellular phone carrier charges $26.50 a month plus $0.15 a minute for local calls. Another carrier charges $14.50 a month and $0.25 a minute for local calls. For how many minutes is the cost of the plans the same?

Lesson 6 Homework Practice

Inequalities
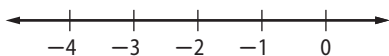
Write an inequality for each sentence.

1. More than 3400 people attended the flea market.

2. Her earnings at $11 per hour were no more than $121.

3. The 10-km race time of 84 minutes was at least twice as long as the winner's time.

4. A savings account increased by $70 is now more than $400.

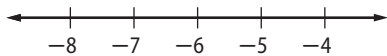**For the given value, state whether each inequality is *true* or *false*.**

5. $9 - x > 3$, $x = 6.5$

6. $9.5 + n < 19$, $n = 10$

7. $3k < 27\frac{1}{2}$, $k = 8$

8. $21 \leq 4c$, $c = 5.2$

9. $\frac{x}{4} \leq 8$, $x = 32$

10. $\frac{9}{c} > 2$, $c = 3\frac{1}{2}$

Graph each inequality on a number line.

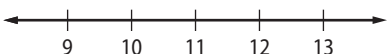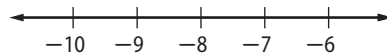**11.** $a < -2$

12. $t > -6$

13. $d \geq 7$
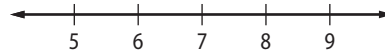
14. $b \geq 11$

15. $x \leq -8$

16. $w > 5$
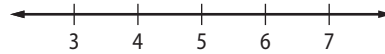
17. $n < 20$
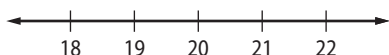
18. $b \leq -4$
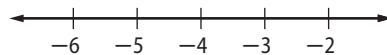
19. $a \geq -6$
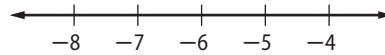
Write an inequality for each graph.

20.

21.

22.

23.
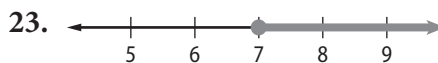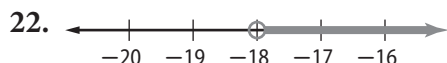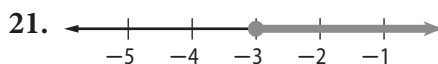
24. The average time a human being can hold their breath underwater is 1 minute. A hippo can hold its breath underwater for at least 5 times as long as a human. Write an inequality that represents how long a hippo can hold its breath underwater.

25. In the first hour of a charity auction, $4800 was raised. This was at most $1200 more than was raised in the second hour of the auction. Write an inequality that represents the amount raised in the second hour.

Lesson 7 Homework Practice

Solving Inequalities

Solve each inequality. Check your solutions.

1. $-6 \geq g + 4$

2. $15 + d > 10$

3. $p + (-8) \leq -12$

4. $-13 < k - (-16)$

5. $-1 + s \leq 5$

6. $12 > w - (-0.3)$

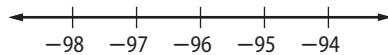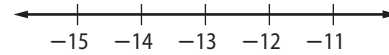**7.** $-1\frac{7}{8} < d + (-2)$

8. $z - 0.9 > -4.8$

9. $b - \frac{1}{5} < 3\frac{1}{10}$

Solve each inequality. Graph each solution on a number line.

10. $24 \geq \dfrac{g}{-4}$

−98   −97   −96   −95   −94

11. $-78 > 6h$

−15   −14   −13   −12   −11

12. $\dfrac{f}{-5} < -12$

58   59   60   61   62

13. $100 \geq -4s$

−27   −26   −25   −24   −23

14. $\dfrac{p}{-36} < 6$

−218 −217 −216 −215 −214

15. $-4 > \dfrac{c}{-3.5}$

12   13   14   15   16

16. $-24 < \dfrac{1}{2}b$

−50   −49   −48   −47   −46

17. $-3 \leq \dfrac{c}{-1.5}$

2   3   4   5   6
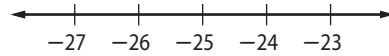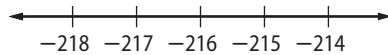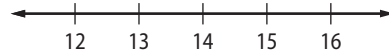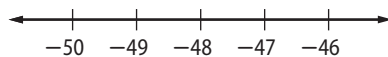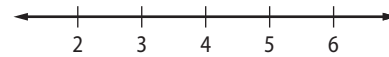
18. A certain minivan has a maximum carrying capacity of 1200 pounds. If the luggage weighs 150 pounds, what is the maximum weight allowable for passengers?

19. To qualify for a store discount, Jorge's soccer team must spend at least $560 for new jerseys. The team needs 20 jerseys.

  a. Write an inequality to represent how much the team should spend on each jersey to qualify for the discount.

  b. How much should the team spend for each jersey?

Lesson 8 Homework Practice

Solving Multi-Step Equations and Inequalities

Solve. Check your solutions.

1. $4(j - 7) = 12$

2. $5(2k + 10) = 40$

3. $7(2p + 3) - 8 = 14p - 13$

4. $7(g - 4) = 3$

5. $3(4c + 5) = 24$

6. $2(a - 1) = 3(a + 1)$

7. $3(x - 3) = 5(1.5 + x)$

8. $2(1.5m + 3) = 3.5m - 1$

9. $a - \frac{1}{2} = 2a - \frac{3}{5}$

10. $2\frac{1}{5}x - 5 = 2(1\frac{2}{5}x + 3)$

11. $\frac{d}{0.2} = 3d + 2.1$

12. $5n + 3 = 2(n + 2) + 3n$

13. $\frac{2}{3}a + 2 = \frac{1}{3}(4a + 1)$

14. $y - 7 = \frac{1}{4}(y + 2)$

Solve. Graph each solution on a number line.

15. $\frac{2}{3}(12 - x) > 4$
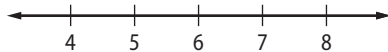
16. $\frac{1}{2}(8 - c) < 7.5$
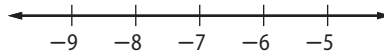
17. $\frac{c}{3} + 7 > 5\frac{1}{2}$
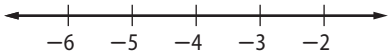
18. $7 + 2p < -14$
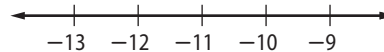
19. $-3(x + 3) > 7.5$
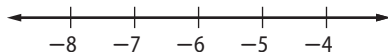
20. $5 - 3c \le c + 17$
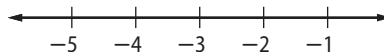
21. $2(n - 5) \le -7$
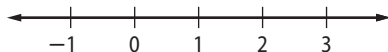
22. $\frac{18 - n}{2} \le 6$
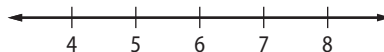
23. The perimeter of a rectangle is 80 feet. Find the dimensions if the length is 5 feet longer than four times the width. Then find the area of the rectangle.

24. Five times the sum of three consecutive integers is 150. What are the integers?

25. Admission to the state fair costs $5 and each ride costs $0.75. If Ahmed wants to spend no more than $14 at the fair, how many rides can he ride?

Lesson 1 Problem-Solving Practice

Solving Equations with Rational Coefficients

1. Cooking time for a turkey is determined using the rate of $\frac{1}{3}$ hour per pound. Mrs. Milton figures she will have at most four hours to cook the turkey. What is the largest turkey she should buy?

2. Josh and his brother will drive from Boston to New York, a distance of 220 miles. If they drive an average speed of 50.5 miles per hour, how long will it take Josh and his brother to arrive in New York? Round to the nearest tenth.

3. A cell phone plan costs $0.20 cents per minute. Lisa has budgeted $35 a month for her cell phone. How many minutes Lisa can use each month?

4. It takes Greg $\frac{1}{6}$ hour to jog one mile. How many miles can Greg jog in 3 hours?

5. Kurt and four friends are eating in the food court at South Center Mall. They will divide the bill equally among the five of them. Two friends order hamburgers and two order pizza. All of them order soda. Kurt has only $3.75 with him. What can Kurt order so that each will pay only $3.75?

Hot dog	Pizza	Hamburger	Soda
$2.50	$1.75	$3.25	$1.25

6. Mr. Paulson plans to make 6 pounds of yams. If one person eats $\frac{1}{2}$ pound of yams, how many people can Mr. Paulson serve with 6 pounds of yams?

Lesson 2 Problem-Solving Practice

Solving Two-Step Equations

1. A plumber charges $45 plus $39.75 per hour of service. Miguel's bill was $164.25. Solve the equation $45 + 39.75x = 164.25$. How many hours of service did the plumber charge?

2. A ranch in Wyoming is approximately 825,000 acres. A total of 8684 fenced-in areas (each with the same size) could fit inside the ranch, with 20 acres of ranch left over. Solve the equation $825,000 = 8684x + 20$ to find the number of acres each fenced-in area would cover.

3. Sasha researched the size of zoos in her state. She found that the zoo in the north part of the state is almost twice as large as the zoo in the south. She also found that the zoo in the south part of the state has 200 fewer than twice the number of animals as the northern zoo. How many animals per acre does each zoo have?

Zoo	Acres	Number of Animals
North	64	?
South	35	3800

4. The perimeter of a local dog park measures 158 feet. If the length of the park is 2 feet less than $\frac{1}{2}$ the width, what are the dimensions of the dog park?

5. A high school band needs $1200 for a trip. So far they have raised $430. They have 5 more fundraisers planned. The equation $430 + 5f = 1200$ represents how much money they must raise at each of the remaining fundraisers. How much money must they raise at each of the remaining fundraisers?

6. Haley bought a membership to an online photo-sharing site for $12. After purchasing the membership, she wanted to buy several prints. Prints cost $0.12 each. She has a total of $18.00 to spend on both the membership and the prints. Solve the equation $12 + 0.12p = 18$ to find the number of prints Haley can purchase.

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Lesson 3 Problem-Solving Practice

Writing Equations

1. Toni spent the day at the mall. At the end of the day, Toni found that she spent a total of $107.50 on lunch, clothes, and school supplies. Toni spent an equal amount on clothes and school supplies. If Toni spent $10.50 on lunch, write an equation that can be used to find how much Toni spent on clothes and school supplies.

2. John and Belinda played nine holes of golf. John's score was 10 strokes less than two times Belinda's score. If John's score was 54 strokes, write and solve an equation to find Belinda's score.

3. The New Orleans Saints scored 2 more points than three times the points scored by the Pittsburgh Steelers. If the New Orleans Saints scored 32 points, write and solve an equation to find the number of points scored by the Pittsburgh Steelers.

4. All of the girls in Danielle's cabin at camp are the same age. Their counselor is 3 times their age. Danielle's age and her counselor's ages add up to 28. Write an equation that can be used to find the ages of Danielle and her counselor.

5. Three businesses donated money to charity. The chart shows the pledges made by the businesses.

Business	Amount Pledged (in millions)
Business A	x
Business B	
Business C	

Business B pledged $20 million less than twice the amount pledged by Business A. Business C pledged $200 million less than twice the amount pledged by Business B. If x represents the amount pledged by Business A, write expressions to show the amounts pledged by Business B and Business C in terms of x.

6. Refer to the information in Exercise 5. The combined pledges of Business A, Business B, and Business C totaled $1035 million. Write an equation that can be used to determine how much each business pledged.

Lesson 4 Problem-Solving Practice

More Two-Step Equations

1. Blake and two of his friends are going to an amusement park. The cost of admission to the park is $39.95 per person. Once they are in the park, Blake and his friends ride the race cars, which require an additional fee. If the total amount spent by all three boys is $143.70, then what is the additional fee to ride the race cars?

2. Fatina's Girl Scout troop of 12 members takes a trip to the local bowling alley. Each girl pays a lane fee at the bowling alley and an additional $5 to rent a pair of bowling shoes. The total cost for all 12 members of her Girl Scout troop to use the bowling lanes and rent shoes is $138. What is the lane fee at the bowling alley?

3. Catherine purchases 8 bags of Cyprus mulch. She has a coupon for $0.75 off each bag of mulch. After applying her coupon towards the purchase, the total cost of the mulch is $22. What is the regular price for a bag of mulch?

4. The pentagon shown here is a regular pentagon, so each side has the same length. The perimeter of the pentagon is 7 inches. What is the value of *s*?

$(s - 06)$ in.
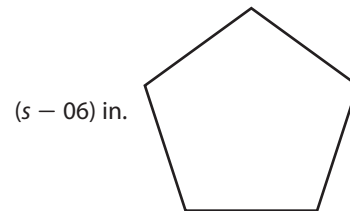
5. Jorge set a personal running goal for to run a total of 120 kilometers. He wants to run the same amount each day for 10 days. If he runs all but 3 kilometers of a nature trail on each day, then how many kilometers is the nature trail?

6. Theresa, Sheila, and Denise spent the day at the beach. Each of them purchased a soda, steak fries, and a personal pizza for lunch. The total cost was $42.45. What was the cost of each personal pizza?

Beach Snack Bar	
Menu Item	**Cost**
Soda	$2.25
Steak fries	$6.95
Funnel Cake	$5.50
Cinnamon Roll	$3.75

Math Accelerated • **Chapter 8** Equations and Inequalities

Lesson 5 Problem-Solving Practice

Solving Equations with Variables on Each Side

1. One hot air balloon is 15 meters above the ground, and is rising at a rate of 20 meters per minute. A second balloon is 195 meters above the ground, and is descending at a rate of 16 meters per minute. In how many minutes will the two balloons be at the same height?

2. A commuter train pulling 8 cars had room for another 84 passengers. Halfway through the commute, the train had to be taken out of service. All of the passengers were transferred to another commuter train that had 6 cars with the same capacity as those in the first train. After all of the passengers transferred to the replacement train, there was room for only 10 more passengers. What is the maximum number of passengers that each car can transport?

3. The table below shows what two rental companies charge for an intermediate 4-door sedan. How many miles must a driver drive in one day to make both options the same price?

	First Choice Car	Best Rent-A-Car
Daily charge	$65	$48
Cost per mile	$0.06	$0.10

4. Cindy is saving for a trip to Hawaii. Each week, she puts aside the same amount of money for her airfare. After 9 weeks of saving, she needs $390 more for her airfare. After 14 weeks, Cindy still needs $240. How much is the airfare to Hawaii? How much does Cindy put aside each week for her airfare?

5. Josh has two leaking pipes in his basement. While waiting for the plumber to come, Josh puts a bucket under each leak. The two buckets each hold the same amount of water. The bucket under the first leak fills in 20 minutes. The bucket under the second leak fills in 35 minutes. Josh's brother takes away one of the buckets and places the one bucket under the two leaks. About how long will it take for the one bucket to fill completely?

6. Refer to the information in Exercise 5. Josh wraps a cloth around the first leak, which cuts the rate of that leak in half. At the same time, it doubles the rate of the second leak. How will this affect the time it takes to fill the bucket?

Lesson 6 Problem-Solving Practice

Inequalities

1. The Texas Transportation Commission can establish a daytime speed limit of 75 miles per hour in counties with a population density of less than 10 persons per square mile. Write an inequality to describe the population density.

2. The front passenger seat of an SUV is equipped with weight sensors that determine the appropriate amount of deployment force of the air bag. If the weight on the front seat is less than 66 pounds, the air bag will not deploy. Write an inequality to show the minimum weight on the passenger seat that would lead to the deployment of the air bag.

3. An amusement park ride cannot safely restrain people under 50 inches tall or over 78 inches tall. Write two different inequalities that shows the safe height limits for riders.

```
Too Tall
78" ◄──
        You
        Can
        Ride!
50" ◄──
Too Short
```

4. One model of a forklift truck can raise a maximum of 1750 kilograms. Write an inequality to describe the maximum number of 40-kilogram boxes that this forklift truck can raise.

5. Agri-Crop sells a system that uses satellites to determine the appropriate amount of fertilizer to dispense on crops. The equipment for the system costs $6000. In addition, there is a yearly fee of $950 for signal reception. How much additional crop revenue would the system have to generate so that the investment is profitable for a farmer over a five-year period?

6. Refer to the information in Exercise 5. A representative from Agri-Corp estimates that the system would yield an additional $100 per acre each year of a certain crop. How large a farm should a farmer have in order to expect to make a profit using the system over a ten-year period?

Lesson 7 Problem-Solving Practice

Solving Inequalities

1. Gabrielle went to the movie theatre with her friends. She had $20.00 to spend. The movie ticket cost $6.25. Write an inequality to determine how much money she had to spend on snacks.

2. An adult female flea lays more than 25,000 eggs every month. What is the minimum number of eggs laid by an adult female flea in one week.
Let 1 month = 4 weeks.

3. The American Quarter Horse is the most popular riding horse in the world. The average weight of an American Quarter Horse at birth is 85 pounds. They grow to a maximum weight of 1300 pounds. Write and solve an inequality to find how many pounds an American Quarter Horse may gain from birth to adulthood.

4. A big league pitching coach tries to limit his pitchers to 110 pitches per game. If the pitcher has already thrown 52 pitches, write and solve an inequality to find how many more pitches he can throw before reaching the limit.

5. Winona Toy Company makes many kinds of toys. The table shows average production times.

Toy	Average Production Time (hours)
fire truck	2
train	$3\frac{1}{3}$
stuffed bear	$2\frac{1}{4}$
doll	4

Stella is a stuffed bear maker. She works 10 hours a day. Write and solve an inequality to determine the maximum number of bears Stella may make in a day.

6. Refer to the table in Exercise 5. Winona Toy company hopes to sell a lot of trains during the holiday season, so the managers hire another worker to make trains. What is the maximum number of trains that two workers can make in a 40-hour work week?

Lesson 8 Problem-Solving Practice

Solving Multi-Step Equations and Inequalities

1. In September 2010, the average price of gasoline was $3.81 a gallon. This price represented an increase of $2.31 less than twice the price the previous year. Use the equation $3.81 = 2x - 2.31$ to determine the price of gasoline in September 2009.

2. The length of one side of a regular hexagon is x. A regular pentagon also has a side length of x. A square is constructed with a side length of x. The total perimeter of all three figures in 105 centimeters. What is the length each side of the figures?

3. An excavation crew is digging a tunnel under a bay. The crew has dug 573 meters of the tunnel, which is 34 meters past the halfway point of the tunnel. What will be the length of the tunnel when the crew has finished digging?

4. A group of friends went on a three-day hike. During the second day of the hike, the group hiked twice as far as they did on the first day. On the third day, they hiked twelve miles farther than the combined distance of the first two days. In all, they hiked 24 miles. How far did they hike on the first day?

5. Nathan is interested in leasing a new car. He collected this information from two leasing companies.

Leasing Company	Monthly Payment	Mileage Limit	Extra Mileage Charge
ABC	$463	10,000	$0.25/mi
XYZ	$473.50	12,000	$0.10/mi

Nathan's drive to and from work each day is about 45 miles. If he goes to work about 226 days in a given year, what is the minimum amount he would have to pay in excess mileage if he leased from the ABC Leasing Company?

6. Refer to the table in Exercise 5. If Nathan leases a new car from XYZ Company, how many miles can he drive after work or on the weekend without being charged for excess mileage?

Unit 4 Extension – Expressions & Algebra Review(Chapter 5 in old text)

Topics

Sequences

Properties of Operations

Adding & Subtracting Expressions

Order of Operations (complex)

Exponents

Simplifying Algebraic Expressions

Distributive Property

Name:_____

Team:_____ Math Period:_____ Teacher:_____

Sequences

What You'll Learn

Write the math and the real-world definitions of sequence.

- math definition _____

  _____

- real-world definition _____

  _____

HOW can you use numbers and symbols to represent mathematical ideas?

Vocabulary

sequence
term
arithmetic sequence

Common Core State Standards

Content Standards
Preparation for 7.EE.1 and 7.EE.2

Mathematical Practices
1, 2, 3, 4

Vocabulary Start-Up

A **sequence** is an ordered list of numbers. Each number in a sequence is called a **term**. In an **arithmetic sequence**, each term is found by adding the same number to the previous term.

Complete the graphic organizer below.

arithmetic sequences

Numbers
Continue each sequence.
1, 3, 5, 7, ___ , ...

1, 1.5, 2, ___ , ___ , ___ , ...

Words
Describe each sequence.
Add ___ to the previous term.
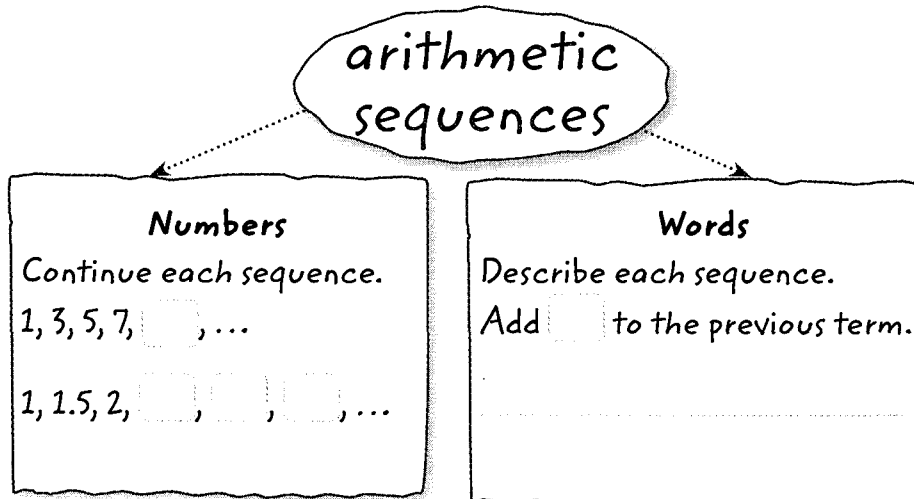
Real-World Link

Horseback Riding The number of students who went on each horseback riding trip is shown. Do the numbers represent the terms of an arithmetic sequence? Explain.

Trip	1	2	3	4	5
Number of Students	15	16	18	21	25

Page 18
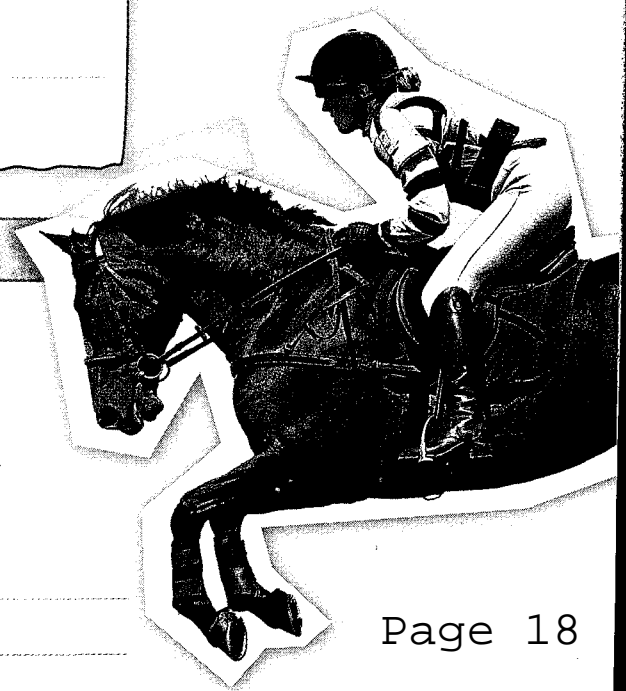
Describe and Extend Sequences

In an arithmetic sequence, the terms can be whole numbers, fractions, or decimals.

Examples

Tutor

1. **Describe the relationship between the terms in the arithmetic sequence 8, 13, 18, 23, ... Then write the next three terms in the sequence.**

8, 13, 18, 23, ...

+5 +5 +5

Each term is found by adding 5 to the previous term.

Continue the pattern to find the next three terms.

$23 + 5 = 28$ $28 + 5 = 33$ $33 + 5 = 38$

The next three terms are 28, 33, and 38.

2. **Describe the relationship between the terms in the arithmetic sequence 0.4, 0.6, 0.8, 1.0, ... Then write the next three terms in the sequence.**

0.4, 0.6, 0.8, 1.0, ...

+0.2 +0.2 +0.2

Each term is found by adding 0.2 to the previous term.

Continue the pattern to find the next three terms.

$1.0 + 0.2 = 1.2$ $1.2 + 0.2 = 1.4$ $1.4 + 0.2 = 1.6$

The next three terms are 1.2, 1.4, and 1.6.

Show your work.

a. _____

b. _____

Got It? Do these problems to find out.

Describe the relationship between the terms in each arithmetic sequence. Then write the next three terms in the sequence.

c. _____

a. 0, 13, 26, 39, ...   **b.** 4, 7, 10, 13, ...

c. 1.0, 1.3, 1.6, 1.9, ...   **d.** 2.5, 3.0, 3.5, 4.0, ...

d. _____

Write an Algebraic Expression

Watch ▶

In a sequence, each term has a specific position within the sequence. Consider the sequence 2, 4, 6, 8,...

| 1st position | | 3rd position |

2, 4, 6, 8,...

| 2nd position | | 4th position |
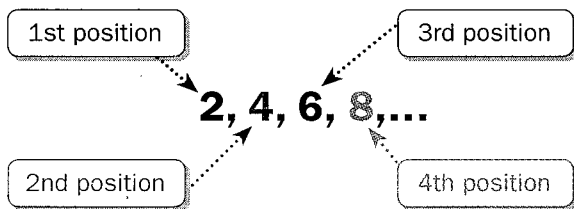
Notice that as the position number increases by 1, the value of the term increases by 2.

Position	Operation	Value of Term
1	$1 \cdot 2 = 2$	2
2	$2 \cdot 2 = 4$	4
3	$3 \cdot 2 = 6$	6
4	$4 \cdot 2 = 8$	8

+1 ... +2

Arithmetic Sequences
When looking for a pattern between the position number and each term in the sequence, it is often helpful to make a table.

You can also write an algebraic expression to represent the relationship between any term in a sequence and its position in the sequence. In this case, if n represents the position in the sequence, the value of the term is $2n$.

Example

Tutor 💬

3. The greeting cards that Meredith makes are sold in boxes at a gift store. The first week, the store sold 5 boxes. Each week, the store sells five more boxes. The pattern continues. What algebraic expression can be used to find the total number of boxes sold at the end of the 100th week? What is the total?

Position	Operation	Value of Term
1	$1 \cdot 5$	5
2	$2 \cdot 5$	10
3	$3 \cdot 5$	15
n	$n \cdot 5$	$5n$

Each term is 5 times its position. So, the expression is $5n$.

$5n$ Write the expression.

$5(100) = 500$ Replace n with 100.

At the end of 100 weeks, 500 boxes will have been sold.

Page 20

Lesson 2 Sequences **359**

12

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STOP and Reflect

Suppose Figure 1 had 3 circles, Figure 2 had 5 circles, and Figure 3 had 7 circles. What algebraic expression represents this situation?

Show your work.

e. _____

Got It? Do this problem to find out.

e. If the pattern continues, what algebraic expression can be used to find the number of circles used in any figure? How many circles will be in the 50th figure?

Figure 1   Figure 2   Figure 3
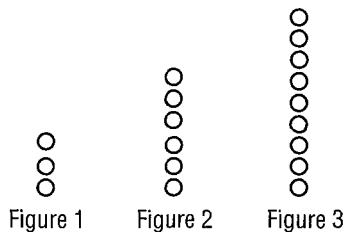
Guided Practice

**Describe the relationship between the terms in each arithmetic sequence.
Then write the next three terms in each sequence.** (Examples 1 and 2)

1. 0, 9, 18, 27, ...

2. 4, 9, 14, 19, ...

3. 1, 1.1, 1.2, 1.3, ...

Show your work.

4. Hannah has a doll collection. The table shows the number of dolls she bought the first three years. Suppose this pattern continues. Write an algebraic expression to find the number of dolls in her collection after *n* years? How many dolls will Hannah collect during the 25th year? (Example 3)

Year	Number of Dolls
1	6
2	12
3	18

5. ![e] **Building on the Essential Question** Explain why the following sequence is considered an arithmetic sequence.

5, 9, 13, 17, 21, ...

Rate Yourself!

How confident are you about sequences? Check the box that applies.
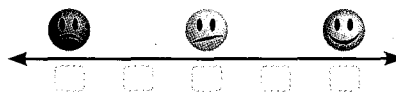
For more help, go online to access a Personal Tutor.

[Tutor]

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360 Chapter 5 Expressions

13

Page 21

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Independent Practice

eHelp

Describe the relationship between the terms in each arithmetic sequence. Then write the next three terms in each sequence. (Examples 1 and 2)

1. 0, 7, 14, 21, …

Show your work.

2. 1, 7, 13, 19, …

3. 26, 34, 42, 50, …

4. 0.1, 0.4, 0.7, 1.0, …

5. 2.4, 3.2, 4.0, 4.8, …

6. 2.0, 3.1, 4.2, 5.3, …

7. Refer to the table shown. If the pattern continues, what algebraic expression can be used to find the plant's height for any month? What will be the plant's height at 12 months? (Example 3)

Month	Height (in.)
1	3
2	6
3	9

8. **CCSS** **Model with Mathematics** Explain how the number of text messages Dario sent and the cost form an arithmetic sequence. Then write an expression to find Dario's text messaging bill if he sends n number of text messages over 250.

Watch ▶ Replay it online!
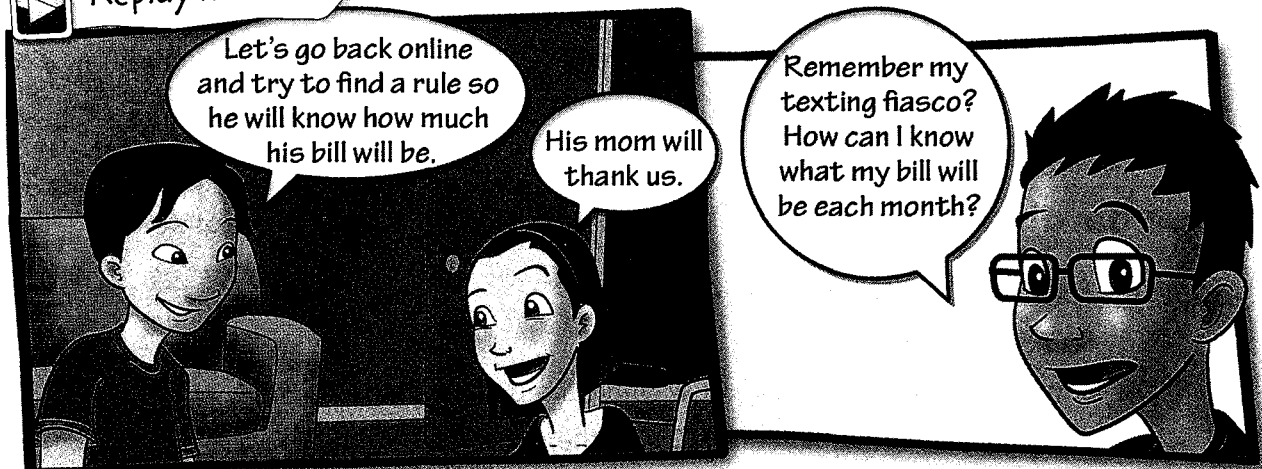
9. **CCSS Multiple Representations** Kendra is stacking boxes of tissues for a store display. She stacks 3 boxes the first minute, 6 boxes the second minute, and 9 boxes the third minute. Suppose the pattern continues for parts **a–d**.

a. **Table** Make a table of values for 1, 2, 3, 4, and 5 minutes.

b. **Symbols** Write an expression to find the *n*th term in the sequence.

c. **Graph** Graph the table of values from part **a** on the coordinate plane. Let x represent the number of minutes and y represent the number of boxes. Then describe the graph.
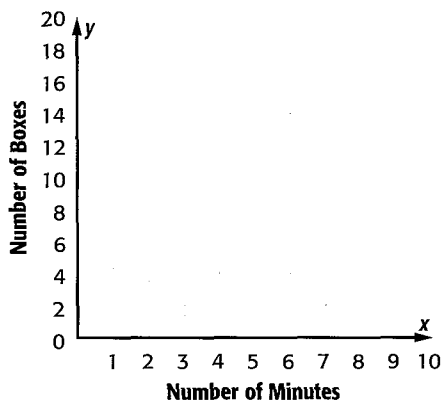
d. **Numbers** How many boxes will be displayed after 45 minutes?

H.O.T. Problems Higher Order Thinking

10. **CCSS Justify Conclusions** Write five terms of an arithmetic sequence and describe the rule for finding the terms.

CCSS Persevere with Problems Not all sequences are arithmetic. But, there is still a pattern. Describe the relationship between the terms in each sequence. Then write the next three terms in the sequence.

11. 1, 2, 4, 7, 11, ...

12. 0, 2, 6, 12, 20, ...

Standardized Test Practice

13. What is the rule for the following sequence?

   4.1, 4.6, 5.1, 5.6, 6.1,...

   Ⓐ Add 5 to the previous term.

   Ⓑ Add 0.5 to the previous term.

   Ⓒ Multiply the previous term by 5.

   Ⓓ Divide the previous term by 5.

Page 23

Extra Practice

Describe the relationship between the terms in each arithmetic sequence.
Then write the next three terms in each sequence.

14. 19, 31, 43, 55, …

12 is added to the previous term; 67, 79, 91

15. 6, 16, 26, 36, …

10 is added to the previous term; 46, 56, 66

16. 33, 38, 43, 48, …

Homework Help

17. 4.5, 6.0, 7.5, 9.0, …

18. 1.2, 3.2, 5.2, 7.2, …

19. 4.6, 8.6, 12.6, 16.6, …

20. 18, 33, 48, 63, …

21. 20, 45, 70, 95, …

22. 38, 61, 84, 107, …

23. **CCSS** **Reason Abstractly** Refer to the figures for parts **a.** and **b.**
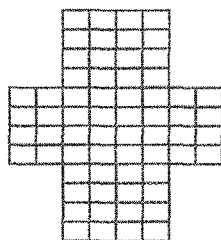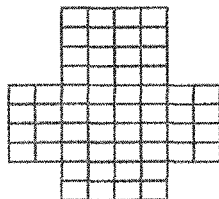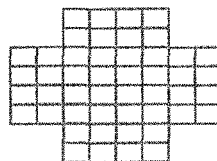
Figure 1   Figure 2   Figure 3

a. Describe the relationship between the figures and the number of
rectangles shown. _____

b. If the pattern continues, how many rectangles will be in the next
2 figures? _____

**The terms of an arithmetic sequence can be related by subtraction. Write
the next three terms of each sequence.**

24. 32, 27, 22, 17, …

25. 45, 42, 39, 36, …

26. 10.5, 10, 9.5, 9, …

Page 24

27. Which sequence follows the rule $3n - 2$, where n represents the position of a term in the sequence?

  Ⓐ 21, 18, 15, 12, 9, ...

  Ⓑ 3, 6, 9, 12, 15, ...

  Ⓒ 1, 7, 10, 13, 16, ...

  Ⓓ 1, 4, 7, 10, 13, ...

28. Which expression can be used to find the nth term in this sequence?

Position	1	2	3	4	5	n
Value of Term	2	5	10	17	26	▨

  Ⓕ $n^2 + 1$ Ⓗ $n + 1$

  Ⓖ $2n + 1$ Ⓘ $2n^2 + 2$

29. Short Response What expression can be used to find the nth term in the sequence 5, 7, 9, 11, ...?

Evaluate. 6.EE.1

30. $1^4 =$

31. $3^3 =$

32. $8^2 =$

33. $10^4 =$

34. $5^1 =$

35. $7^5 =$

36. Jayden goes to the batting cage. He purchases three tokens and rents a helmet. If he spends a total of $6.50, how much is each token? 6.EE.6

Batting Cage Prices	
Tokens	▨
Helmet Rental	$2

Page 25

Properties of Operations

What You'll Learn

Scan the lesson. List two headings you would use to make an outline of the lesson.

- _____

  _____

- _____

  _____

Real-World Link

Driving Miss Ricardo drives up and down her street to complete different errands. Some of the places on her street are shown below. The number of blocks between the places are also shown.

2 blocks   1 block   3 blocks
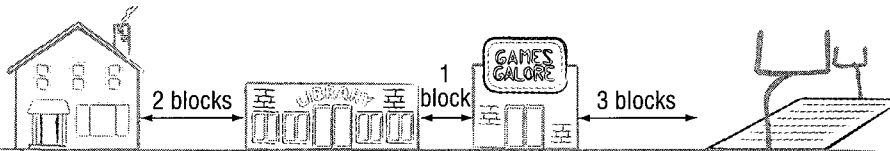
1. Suppose Miss Ricardo drives from home to the game store and back. Write an expression for each distance.

   from home to   from the game
   the game store: _____   store to home: _____

2. Circle the property that is illustrated in Exercise 1.

   Commutative   Associative

3. On Monday, Miss Ricardo drives from home, stops at the library, and then drives to the football field. On Tuesday, she drives from home, stops at the game store, and then drives to the football field. Write an expression for each distance.

   Monday: _____   Tuesday: _____

4. Circle the property that is illustrated in Exercise 3.

   Commutative   Associative

Essential Question

HOW can you use numbers and symbols to represent mathematical ideas?

Vocabulary

Commutative Property
Associative Property
property
Additive Identity Property
Multiplicative Identity Property
Multiplicative Property of Zero
counterexample

Common Core State Standards

Content Standards
7.EE.1, 7.EE.2
Mathematical Practices
1, 3, 4, 5, 7

Properties of Operations

Watch ▶

Work Zone

Words The **Commutative Property** states that the order in which numbers are added or multiplied does not change the sum or product.

	Addition	**Multiplication**
Symbols	$a + b = b + a$	$a \cdot b = b \cdot a$
Examples	$6 + 1 = 1 + 6$	$7 \cdot 3 = 3 \cdot 7$

Words The **Associative Property** states that the way in which numbers are grouped when they are added or multiplied does not change the sum or product.

	Addition	**Multiplication**
Symbols	$a + (b + c) = (a + b) + c$	$a \cdot (b \cdot c) = (a \cdot b) \cdot c$
Examples	$2 + (3 + 8) = (2 + 3) + 8$	$3 \cdot (4 \cdot 5) = (3 \cdot 4) \cdot 5$

A **property** is a statement that is true for any number.
The following properties are also true for any numbers.

Property	Words	Symbols	Examples
Additive Identity	When 0 is added to any number, the sum is the number.	$a + 0 = a$ $0 + a = a$	$9 + 0 = 9$ $0 + 9 = 9$
Multiplicative Identity	When any number is multiplied by 1, the product is the number.	$a \cdot 1 = a$ $1 \cdot a = a$	$5 \cdot 1 = 5$ $1 \cdot 5 = 5$
Multiplicative Property of Zero	When any number is multiplied by 0, the product is 0.	$a \cdot 0 = 0$ $0 \cdot a = 0$	$8 \cdot 0 = 0$ $0 \cdot 8 = 0$

Example

Tutor 💬

1. **Name the property shown by the statement $2 \cdot (5 \cdot n) = (2 \cdot 5) \cdot n$.**

The order of the numbers and variable did not change, but their grouping did. This is the Associative Property of Multiplication.

Show your work.

a. _____

Got It? Do these problems to find out.

b. _____

a. $42 + x + y = 42 + y + x$ **b.** $3x + 0 = 3x$

You may wonder if any of the properties apply to subtraction or division. If you can find a **counterexample**, an example that shows that a conjecture is false, the property does not apply.

Example

> Tutor

2. **State whether the following conjecture is *true* or *false*. If *false*, provide a counterexample.**

Division of whole numbers is commutative.

Write two division expressions using the Commutative Property.

$15 \div 3 \stackrel{?}{=} 3 \div 15$ State the conjecture.

$5 \neq \dfrac{1}{5}$ Divide.

The conjecture is false. We found a counterexample. That is, $15 \div 3 \neq 3 \div 15$. So, division is *not* commutative.

Got It? Do this problem to find out.

c. The difference of two different whole numbers is always less than both of the two numbers.

Show your work.

c. _____

Example

> Tutor

3. **Alana wants to buy a sweater that costs \$38, sunglasses that costs \$14, a pair of jeans that costs \$22, and a T-shirt that costs \$16. Use mental math to find the total cost before tax.**

Write an expression for the total cost. You can rearrange the numbers using the properties of math. Look for sums that are multiples of ten.

$38 + 14 + 22 + 16$

$= 38 + 22 + 14 + 16$ Commutative Property of Addition

$= (38 + 22) + (14 + 16)$ Associative Property of Addition

$= 60 + 30$ Add.

$= 90$ Simplify.

The total cost of the items is \$90.

Got It? Do this problem to find out.

d. Lance made four phone calls from his cell phone today. The calls lasted 4.7, 9.4, 2.3, and 10.6 minutes. Use mental math to find the total amount of time he spent on the phone.

Show your work.

d. _____

Page 28

20

Examples

Simplify Algebraic Expressions
To simplify an expression is to perform all possible operations.

Simplify each expression. Justify each step.

4. $(7 + g) + 5$

$$(7 + g) + 5 = (g + 7) + 5 \qquad \text{Commutative Property of Addition}$$
$$= g + (7 + 5) \qquad \text{Associative Property of Addition}$$
$$= g + 12 \qquad \text{Simplify.}$$

5. $(m \cdot 11) \cdot m$

$$(m \cdot 11) \cdot m = (11 \cdot m) \cdot m \qquad \text{Commutative Property of Multiplication}$$
$$= 11 \cdot (m \cdot m) \qquad \text{Associative Property of Multiplication}$$
$$= 11m^2 \qquad \text{Simplify.}$$

Show your work.

Got It? Do this problem to find out.

e. _____

e. $4 \cdot (3c \cdot 2)$

Guided Practice

Name the property shown by each statement. (Example 1)

1. $3m \cdot 0 \cdot 5m = 0$

2. $7c + 0 = 7c$

3. State whether the following conjecture is *true* or *false*. If *false*, provide a counterexample. (Example 2)

   Subtraction of whole numbers is associative.

4. Simplify $9c + (8 + 3c)$. Justify each step. (Examples 3–5)

5. **Building on the Essential Question** Explain the difference between the Commutative and Associative Properties.

Rate Yourself!

Are you ready to move on?
Shade the section that applies.

YES (?) NO

For more help, go online to access a Personal Tutor.

Independent Practice

Name the property shown by each statement. (Example 1)

1. $a + (b + 12) = (b + 12) + a$

2. $(5 + x) + 0 = 5 + x$

3. $16 + (c + 17) = (16 + c) + 17$

4. $d \cdot e \cdot 0 = 0$

5. **CCSS** **Use a Counterexample** State whether the conjecture is true or false. If false, provide a counterexample. (Example 2)

Division of whole numbers is associative.

6. Darien ordered a soda for $2.75, a sandwich for $8.50, and a dessert for $3.85. Sales tax was $1.15. Use mental math to find the total amount of the bill. Explain. (Example 3)
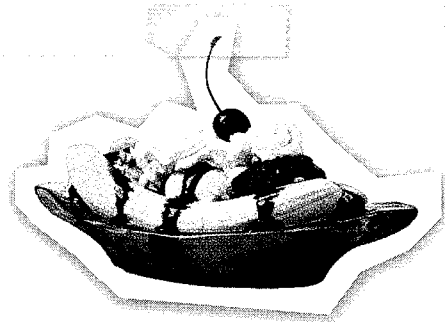
Simplify each expression. Justify each step. (Examples 4 and 5)

7. $15 + (12 + 8a)$

8. $(5n \cdot 9) \cdot 2n$

9. $3x \cdot (7 \cdot x)$

10. $(4m \cdot 2) \cdot 5m$

Page 30

11. Simplify the expression $(7 + 47 + 3)[5 \cdot (2 \cdot 3)]$. Use properties to justify each step.

🔥 H.O.T. Problems Higher Order Thinking

12. 🟠 **Model with Mathematics** Write about something you do every day that is commutative. Then write about another situation that is not commutative.

13. 🟠 **Find the Error** Blake is simplifying $4 \cdot (5 \cdot m)$. Find his mistake and correct it.

$$4 \cdot (5 \cdot m) = 20 \cdot 5m$$
$$= 100m$$

14. 🟠 **Identify Structure** Does the Associative Property *always*, *sometimes*, or *never* hold for subtraction? Explain your reasoning using examples and counterexamples.

✏️ Standardized Test Practice

15. Which equation is an example of the Commutative Property?

Ⓐ $4 \cdot 1 = 4$

Ⓑ $16 + 0 = 16$

Ⓒ $w + (3 + 2) = w + (2 + 3)$

Ⓓ $d(9 \cdot f) = (d \cdot 9)f$

Extra Practice

Name the property shown by each statement.

16. $9(ab) = (9a)b$

Associative $(\times)$

17. $y \cdot 7 = 7y$

18. $1 \times c = c$

19. $5 + (a + 8) = (5 + a) + 8$

20. State whether the conjecture is true or false. If false, provide a counterexample.

Subtraction of whole numbers is commutative.

21. **CCSS Use Math Tools** The times for each leg of a relay for four runners are shown. Use mental math to find the total time for the relay team. Explain.

Runner	Time (s)
Jamal	12.4
Kenneth	11.8
Bryce	11.2
Jorge	12.6

Simplify each expression. Justify each step.

22. $(22 + 19b) + 7$

23. $18 + (5 + 6m)$

24. $11s(4)$

25. $10y(7)$

26. $(9 + 31 + 5)[(7 \cdot 5) \cdot 4]$

Page 32

27. The equation $15 + 0 = 15$ is an example of which of the following properties?

(A) Multiplicative Property of Zero

(B) Multiplicative Identity

(C) Additive Identity

(D) Associative Property

28. Short Response Simplify the expression below. Show and justify each step.

$$14 + (4p + 46) + 0$$

29. Short Response The table shows the cost of different items at a bakery. Write a numerical expression to find the total cost of a doughnut, muffin, and cookie.

Item	Cost ($)
Doughnut	2.29
Muffin	2.50
Cookie	2.21
Roll	1.15

Common Core Review

Evaluate each expression if $a = 6$, $b = 15$, and $c = 9$. 6.EE.2

30. $a + 2b$

31. $c^2 - 5$

32. $10 + a^3$

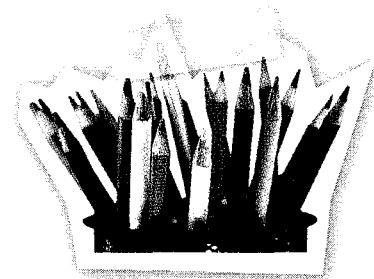**33.** $8c - 9 + 25$

34. $14 + 8b \div 2$

35. $3^3 \div (3a)$

36. A package of pencils costs $1.25. A new eraser costs $0.45. Write an expression to find the total cost of 3 packages of pencils and 2 erasers. Then find the total cost. 6.EE.2

Lesson 3 Skills Practice

Adding Linear Expressions

Add. Use models if needed.

1. $(x + 8) + (6x + 3)$

2. $(-2x + 8) + (-4x + 2)$

3. $(7x + 2) + (6x + 12)$

4. $(10x - 4) + (12x + 8)$

5. $(-2x + 1) + (-x + 5)$

6. $(9x - 1) + (-5x - 3)$

7. $(7x + 4) + (3x - 9)$

8. $(-8x + 4) + (-3x + 2)$

9. $(-2x + 3) + (2 + 6x)$

10. $(4x - 7) + (-6x + 18)$

11. $(8x + 1) + (5x + 2)$

12. $(-x + 3) + (-4 - 7x)$

13. $(-5x - 3) + (-4x - 7)$

14. $(2x + 3) + (x + 3)$

15. $(11x + 6) + (-8x + 3)$

16. $(15x - 16) + (20x + 13)$

17. $(12x - 23) + (17 + 4x)$

18. $(-x - 1) + (-5x + 11)$

19. $(-20x + 15) + (14x - 19)$

20. $(4x + 9) + (10x - 5) + (-11x - 2)$

21. $(2x + 1) + (4x - 3) + (x + 4)$

22. $(-x - 5) + (4x - 6) + (-x + 14)$

23. $(9x + 4) + (-3x + 7) + (-2x - 1)$

24. $(5x + 4) + (-7x - 8) + (-2x + 1)$

Lesson 4 Skills Practice

Subtracting Linear Expressions

Subtract. Use models if needed.

1. $(3x - 3) - (x - 1)$

2. $(2x + 3) - (2x + 1)$

3. $(x - 7) - (x - 2)$

4. $(6x + 1) - (x + 1)$

5. $(-12x - 5) - (6x - 8)$

6. $(-3x - 5) - (-2x + 1)$

7. $(8x - 4) - (-3 + 2x)$

8. $(7x - 12) - (4x - 3)$

Write the subtraction problems modeled in the problems shown.

9.

10.
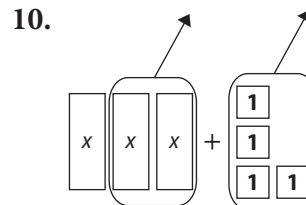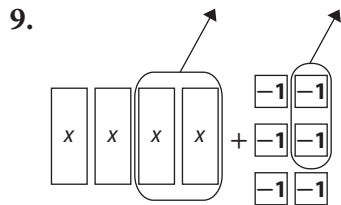
Subtract. Use models if needed.

11. $(3x - 2) - (x - 5)$

12. $(5x + 3) - (x + 6)$

13. $(x - 1) - (x - 4)$

14. $(4x + 1) - (2x + 5)$

15. $(5x - 3) - (-7x - 3)$

16. $(-x - 2) - (-3x + 9)$

17. $(-8x + 6) - (7x + 2)$

18. $(7x - 6) - (4x - 10)$

Math Accelerated • **Chapter 7** Algebraic Expressions

"What do you call an ant who likes to be alone?"

Simplify the following expressions. The answer to each problem will match a letter
that will allow you to figure out the joke.

1. $(4 + 12) \div 2$

2. $7(11 - 5)$

3. $13 + 3(8 - 1)$

4. $17 - (21 - 15)2 + 12$

5. $8(17 - 14) + 5(3 + 1)$

6. $53 - 6(27 - 25) + (4 + 14) \div 2$

7. $4[2(3 + 5) + 10]$

8. $18 + 6[26 - 7(1 + 2)]$

9. $\dfrac{6 + 4(10 - 7)}{2}$

10. $\dfrac{3(15 - 13) - 6}{4 \bullet 5}$

11. $\dfrac{2(6 + 8) + 22}{25 \bullet 3 - 50}$

N. 9
U. 120
P. 48
E. 44
B. 62
D. 17
O. 82
L. 24
N. 42
I. 37
E. 8
C. 72
D. 0
A. 50
I. 2
R. 52
T. 34
N. 104
W. 21

$\overline{}_{11}\ \overline{}_{2}\ \overline{}_{10}\ \overline{}_{5}\ \overline{}_{8}\ \overline{}_{1}\ \overline{}_{7}\ \overline{}_{4}\ \overline{}_{6}\ \overline{}_{9}\ \overline{}_{3}$

Joke #2

Order of Operations: With Parenthesis

Evaluate the following expressions. The answer to each problem will match a letter that will allow you to figure out the joke.

Let x = 2, y = 4, z = 5, a = 1, and b = 3

1. $x(y + z)$ D. 0

                                                          H. 7

2. $z(b - a)$
                                                          R. 26

3. $(x + z)(y + a)$ A. 8

                                                          Y. 37

4. $y + b(z - x)$
                                                          S. 18

5. $y + a(x + y) - b$ G. 2

                                                          P. 4

6. $x(a + b + y + z)$
                                                          L. 10

7. $z(y - x) + z(b - a)$ U. 25

                                                          O. 20

8. $[y + b(z - a)] \div x$
                                                          H. 13

9. $b[x(y - a) + z]$ F. 16

                                                          I. 35

10. $\dfrac{x(z + a)}{b}$
                                                          C. 33

11. $\dfrac{y + b(a + a)}{xz}$ S. 1

$$\overline{\underset{11}{}}\ \overline{\underset{9}{}}\ \overline{\underset{4}{}}\ \overline{\underset{7}{}}\ \overline{\underset{2}{}}\ \overline{\underset{8}{}}\ \overline{\underset{6}{}}\ \overline{\underset{1}{}}\ \overline{\underset{5}{}}\ \overline{\underset{3}{}}\ \overline{\underset{10}{}}$$

Joke #4   Evaluating: With Parenthesis

"What do you call 1/1,000,000th of mouthwash?"

Simplify the following expressions. The answer to each problem will match a letter that will allow you to figure out the joke.

1. $(-4)^2$

2. $(-2)^5$

3. $(-3)^3(2)$

4. $(-1)^7(-5)^2$

5. $(-3)^4 + (-3)^3$

6. $(-2)^3 - (-4)^3$

7. $(8 - 12)^3$

8. $\dfrac{(-6)^2}{(-3)^2}$

9. $\dfrac{(-2)(-5)^3}{(10)(-5)}$

10. $(15 - 17)^2 - (-2)^7 - (-7)^2$

T. –65
C. –54
H. 77
O. –25
A. 0
R. 56
D. –2
M. 83
E. 16
G. 1
I. –32
B. 24
C. –5
P. 54
U. –15
S: 4
O: –64

$$\overline{}\ \overline{}\ \overline{}\ \overline{}\ \overline{}\ \overline{}\ \overline{}\ \overline{}\ \overline{}\ \overline{}$$

10 2 9 6 4 8 3 7 5 1

Joke #8   Negatives: Exponents

"What class is the owls' favorite in school?"

Simplify the following expressions. The answer to each problem will match a letter that will allow you to figure out the joke.

1. $4 - (3)(-6)$

2. $(-5)(-11) - (6)(-10)$

3. $-9(5 - 13) + 17$

4. $21 - 2[8 + (-4)(10)]$

5. $(4)(-3)^2 + 17(5 - 7)$

6. $(19 - 21)^3(3) - (-4)^2$

7. $\dfrac{2 + 4(5 - 2)^3}{10}$

8. $\dfrac{-5(3) - 4(7)}{7 + 6(-1)}$

Y. 28

W. –43

A. 89

B. –40

S. –27

L. 115

T. –9

G. 11

N. –18

O. 2

R. 85

I. 38

H. 8

E. 22

$$\overline{}_{5}\ \overline{}_{8}\ \overline{}_{2}\ \ \overset{-}{}\ \overline{}_{7}\ \overline{}_{1}\ \overline{}_{6}\ \overline{}_{4}\ \overline{}_{3}$$

Negatives: Simplifying Integers

Joke #9

"What do you call people who make allegations?"

Simplify the following expressions. Cross out the letter that matches your answer.
The remaining letters will allow you to figure out the joke.

1. 3x + 5x + 14x

2. 4x + 7 + 11x

3. 10x + 8 − 3x

4. 6x − 5 + x − 11

5. -8x + 19 + 2 − 2x

6. −x + 23 + 4x - 34 − x

7. 105 + 27x − 68 − 19x − 27 + x

8. 7x + 16 − 3x + 3 − 2x − 2x

9. −18 + 6 − 4x + 10 - 11x + 2

10. 16 + 4x − 12x − 28 − 6x + 17 + x − 1

A	M	L	E	L
9x − 5	2x − 11	12x	15x + 7	2x + 8
N	I	W	G	U
7x − 16	−15x + 11	22x	19x + 1	9x + 10
A	T	H	B	O
15x − 9	5x + 21	19	−15x	10x + 7
F	C	R	S	Y
−13x + 4	−10x + 21	13x − 5	7x − 20	7x + 8

Simplifying: Addition and Subtraction

"What a matador tries to do."

Simplify the following expressions. The answer to each problem will match a letter that will allow you to figure out the joke.

1. $6(x + 3)$

2. $8(x - 2)$

3. $4(2x + 5)$

4. $5(3x - 7)$

5. $-2(x + 6)$

6. $-3(x - 10)$

7. $7(11 - x)$

8. $-(2x - 15)$

9. $-3(-4x + 5)$

Y. $6x + 12$

M. $15x - 14$

A. $12x - 15$

V. $-7x + 77$

E. $8x - 16$

L. $-3x + 30$

W. $2x + 6$

I. $6x + 18$

O. $15x - 35$

N. $-2x - 6$

F. $7x - 8$

A. $8x + 20$

U. $x + 40$

C. $12x - 2$

B. $-2x + 15$

D. $-2x - 12$

$$\overline{}_{9}\ \overline{}_{7}\ \overline{}_{4}\ \overline{}_{1}\ \overline{}_{5}\ \overline{}_{3}\ \overline{}_{8}\ \overline{}_{6}\ \overline{}_{2}$$

Simplifying: Distributing

Joke #11

"What do you call a horse that can't lose a race?"

Simplify the following expressions. Cross out the letter that matches your answer.
The remaining letters will allow you to figure out the joke.

1. 2(5x – 1) + 3x

2. 6x + 3(2x + 7)

3. 7 – (3x – 4)

4. 10 – 4(6 – x) + 5x

5. 6(x – 4) + 10(2x + 3)

6. –3(6x – 5) + 2x – (–11x + 8)

7. 2(8x – 13) - 8(2x – 4) + 6

8. 5(–2x + 7) – (3x + 22)

9. 4(9x – 1) + 5(3x + 7) – 6(x – 8)

A	S	T	H
12x + 21	10x – 7	–13x + 13	4x – 7
E	C	U	R
9x – 20	26x + 6	13x – 2	11x + 1
L	B	E	M
12	24x – 8	4x – 8	9x – 14
O	T	N	W
–3x + 11	37x - 2	45x + 79	–5x + 7

Simplifying: Distributing and Collecting Like Terms