Name _____ Date_____

Lesson 1: Generating Equivalent Expressions

Exit Ticket

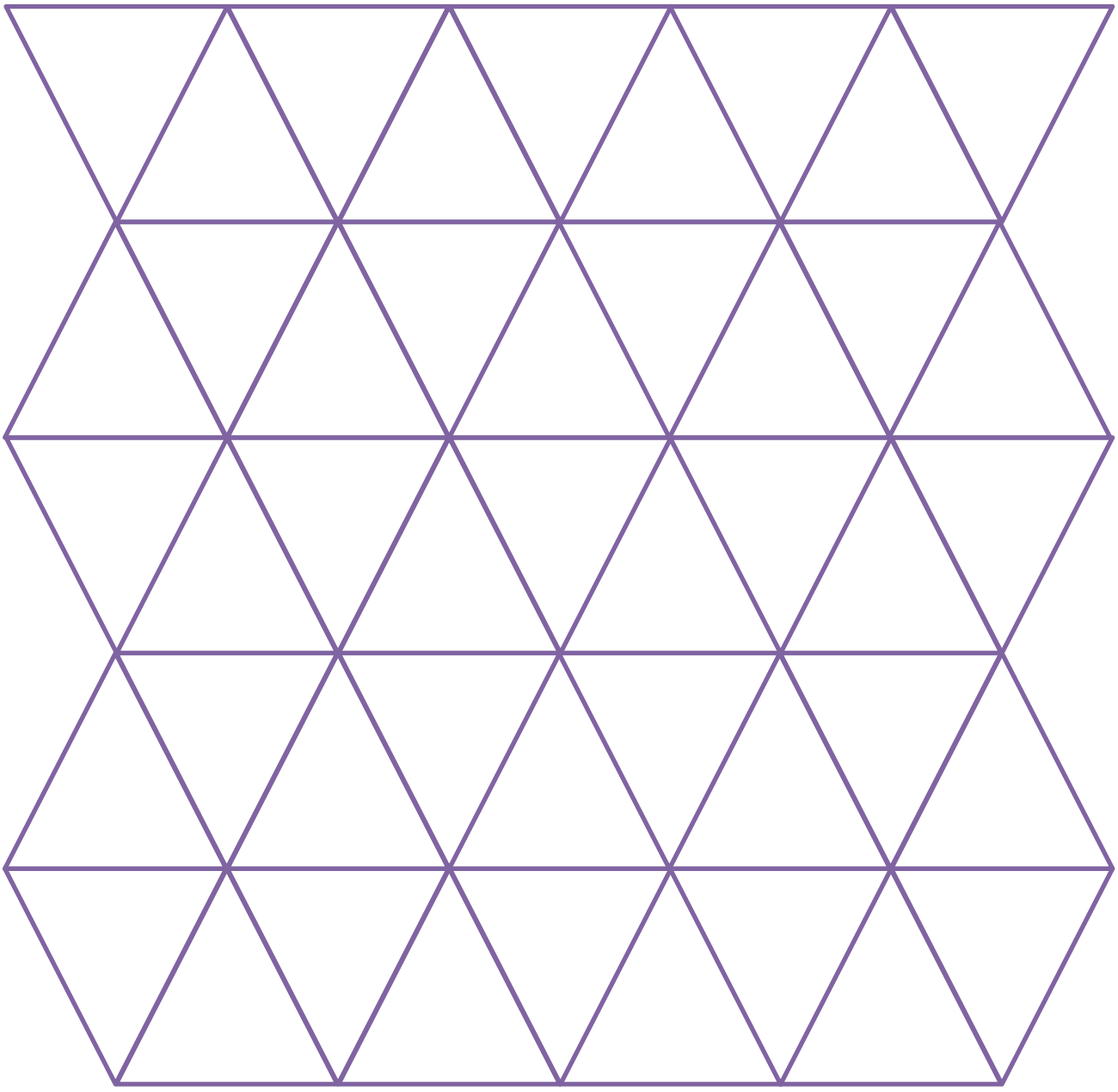
1. Write an equivalent expression to $2x + 3 + 5x + 6$ by combining like terms.

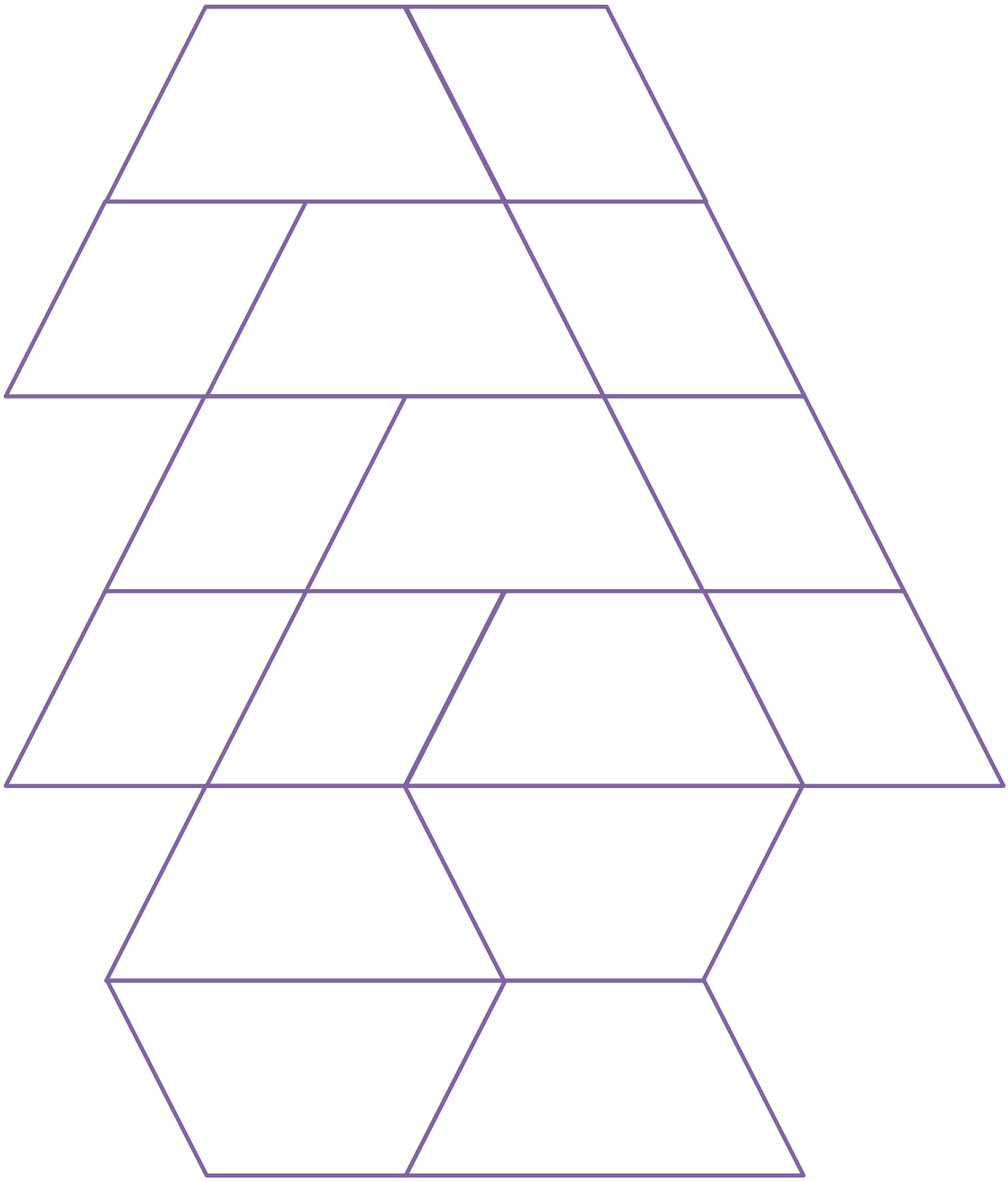
2. Find the sum of $(8a + 2b - 4)$ and $(3b - 5)$.

3. Write the expression in standard form: $4(2a) + 7(-4b) + (3 \cdot c \cdot 5)$.

Materials for Opening Exercise

Photo copy each page and cut out the triangles and quadrilaterals for use in the Opening Exercise.





Name _____ Date_____

Lesson 2: Generating Equivalent Expressions

Exit Ticket

1. Write the expression in standard form:
   $(4f - 3 + 2g) - (-4g + 2)$

2. Find the result when $5m + 2$ is subtracted from $9m$.

3. Rewrite the expression in standard form:
   $27h \div 3h$

Name _____ Date_____

Lesson 2: Generating Equivalent Expressions

Sprint – Round 1

Write each as an equivalent expression in standard form as quickly and accurately as possible within the allotted time.

1. $1+1$		23. $4x+6x-12x$	
2. $1+1+1$		24. $4x-6x+4x$	
3. $(1+1)+1$		25. $7x-2x+3$	
4. $(1+1)+(1+1)$		26. $(4x+3)+x$	
5. $(1+1)+(1+1+1)$		27. $(4x+3)+2x$	
6. $x+x$		28. $(4x+3)+3x$	
7. $x+x+x$		29. $(4x+3)+3x$	
8. $(x+x)+x$		30. $(4x+3)+6x$	
9. $(x+x)+(x+x)$		31. $(11x+2)-2$	
10. $(x+x)+(x+x+x)$		32. $(11x+2)-3$	
11. $(x+x+x)+(x+x+x)$		33. $(11x+2)-4$	
12. $2x+x$		34. $(11x+2)-7$	
13. $3x+x$		35. $(3x-9)+(3x+5)$	
14. $4x+x$		36. $(11-5x)+(4x+2)$	
15. $7x+x$		37. $(2x+3y)+(4x+y)$	
16. $7x+2x$		38. $(5x+3y)+(2x-y)$	
17. $7x+3x$		39. $(2x-y)+(6x-y)$	
18. $10x-x$		40. $(2x-y)+(-6x-y)$	
19. $10x-5x$		41. $(-2x-y)+(-6x-y)$	
20. $10x-10x$		42. $(5x-2y)+(-3x+4x)$	
21. $10x-11x$		43. $(5x-2y)-(-3x+4x)$	
22. $10x-12x$		44. $(7x-2y)-(-y-y)$	

Name _____ Date_____

Lesson 2: Generating Equivalent Expressions

Sprint – Round 2

Write each as an equivalent expression in standard form as quickly and accurately as possible within the allotted time.

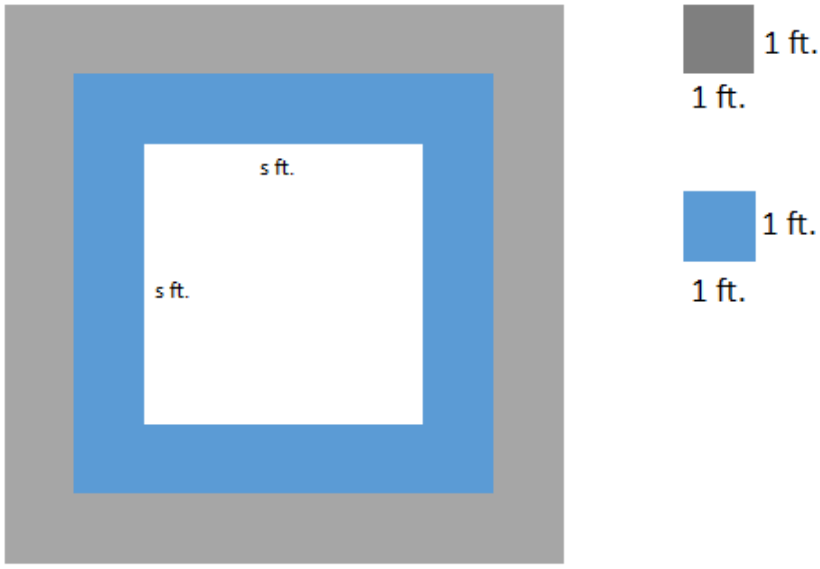
1. $1+1+1$		23. $3x+5x-4x$	
2. $1+1+1+1$		24. $8x-6x+4x$	
3. $(1+1+1)+1$		25. $7x-4x+5$	
4. $(1+1+1)+(1+1)$		26. $(9x-1)+x$	
5. $(1+1+1)+(1+1+1)$		27. $(9x-1)+2x$	
6. $x+x+x$		28. $(9x-1)+3x$	
7. $x+x+x+x$		29. $(9x-1)+5x$	
8. $(x+x+x)+x$		30. $(9x-1)+6x$	
9. $(x+x+x)+(x+x)$		31. $(-3x+3)-2$	
10. $(x+x+x)+(x+x+x)$		32. $(-3x+3)-3$	
11. $(x+x+x+x)+(x+x)$		33. $(-3x+3)-4$	
12. $x+2x$		34. $(-3x+3)-5$	
13. $x+4x$		35. $(5x-2)+(2x+5)$	
14. $x+6x$		36. $(8-x)+(3x+2)$	
15. $x+8x$		37. $(5x+y)+(x+y)$	
16. $7x+x$		38. $(5x+y)+(x-y)$	
17. $8x+2x$		39. $(6x-2y)+(2x-y)$	
18. $2x-x$		40. $(6x-2y)+(-2x+y)$	
19. $2x-2x$		41. $(x-y)+(-x+y)$	
20. $2x-3x$		42. $(x-2y)+(-x+2x)$	
21. $2x-4x$		43. $(x-2y)-(-x+2x)$	
22. $2x-8x$		44. $(5x-6y)-(-4y-2y)$	

Name _____ Date_____

Lesson 3: Writing Products as Sums and Sums as Products

Exit Ticket

A square fountain area with side length s is bordered by two rows of square tiles along its perimeter as shown. Express the total number of grey tiles (only in the second rows) needed in terms of s three different ways.



Name _____ Date_____

Lesson 4: Writing Products as Sums and Sums as Products

Exit Ticket

1. Write the expression below in standard form.
   $3h - 2(1 + 4h)$

2. Write the expression below as a product of two factors.
   $6m + 8n + 4$

Name _____ Date_____

Lesson 5: Using the Identity and Inverse to Write Equivalent Expressions

Exit Ticket

1. Find the sum of $5x + 20$ and the opposite of 20. Write an equivalent expression using the fewest number of terms. Justify each step.

2. For $5x + 20$ and the multiplicative inverse of 5, write the product and then write the expression in standard form, if possible. Justify each step.

Name _____ Date_____

Lesson 6: Collecting Rational Number Like Terms

Exit Ticket

For the problem $\frac{1}{5}g - \frac{1}{10} - g + 1\frac{3}{10}g - \frac{1}{10}$, Tyson created an equivalent expression to the problem using the following steps:

$$\frac{1}{5}g + -1g + 1\frac{3}{10}g + -\frac{1}{10} + -\frac{1}{10}$$

$$-\frac{4}{5}g + 1\frac{1}{10}$$

Is his final expression equivalent to the initial expression? Show how you know. If the two expressions are not equivalent, find Tyson's mistake and correct it.

Name _____ Date_____

Lesson 7: Understanding Equations

Exit Ticket

1. Check whether the given value of x is a solution to the equation. Justify your answer.

   a. $\frac{1}{3}(x+4) = 20$ $x = 48$

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

2. The total cost of four pens and seven mechanical pencils is $\$13.25$. The cost of each pencil is 75 cents.

   a. Using an arithmetic approach, find the cost of a pen.

   b. Let the cost of a pen be p dollars. Write an expression for the total cost of four pens and seven mechanical pencils in terms of p.

c. Write an equation that could be used to find the cost of a pen.

d. Determine a value for p for which the equation you wrote in part (b) is true.

e. Determine a value for p for which the equation you wrote in part (b) is false.

Name _____ Date_____

Lesson 8: Using If-Then Moves in Solving Equations

Exit Ticket

Mrs. Canale's class is selling frozen pizzas to earn money for a field trip. For every pizza sold, the class makes $5.35. They have already earned $182.90 toward their $750 goal. How many pizzas must they sell to earn $750? Solve this problem first by using an arithmetic approach, then by using an algebraic approach. Compare the calculations you made using each approach.

Name _____ Date_____

Lesson 9: Using If-Then Moves in Solving Equations

Exit Ticket

1. Brand A scooter has a top speed that goes 2 miles per hour faster than Brand B. If after 3 hours, Brand A scooter traveled 24 miles, at what rate did Brand B scooter travel at its top speed? Write an equation to determine the solution. Identify the if-then moves used in your solution.

2. At each scooter's top speed, Brand A scooter goes 2 miles per hour faster than Brand B. If after 3 hours, Brand A scooter traveled 40.2 miles, at what rate did Brand B scooter travel? Write an equation to determine the solution and then write an equivalent equation using only integers.

GROUP 1: Where can you buy a ruler that is 3 feet long?

____	_____	_____	_____	_____	_____	_____	_____
3	$4\frac{1}{2}$	3.5	-1	-2	19	18.95	4.22

What value(s) of z makes the equation $\frac{7}{6}z + \frac{1}{3} = -\frac{5}{6}$ true; $z = -1$, $z = 2$, $z = 1$, or $z = -\frac{36}{63}$?	D
Find the smaller of 2 consecutive integers if the sum of the smaller and twice the larger is -4.	S
Twice the sum of a number and -6 is -6. Find the number.	Y
Logan is 2 years older than Lindsey. Five years ago the sum of their ages was 30. Find Lindsey's current age.	A
The total charge for a taxi ride in NYC includes an initial fee of \$3.75 plus \$1.25 for every $\frac{1}{2}$ mile traveled. Jodi took a taxi and the ride cost her exactly \$12.50. How many miles did she travel in the taxi?	R
The perimeter of a triangular garden with 3 equal sides is 12.66 feet. What is the length of each side of the garden?	E
A car travelling at 60 mph leaves Ithaca and travels west. Two hours later a truck travelling at 55 mph leaves Elmira and travels east. All together the car and truck travel 407.5 miles. How many hours does the car travel?	A
The Cozo family has 5 children. While on vacation they went to a play. They bought 5 tickets at the child's price of \$10.25 and 2 tickets at the adult's price. If they spent a total of \$89.15, how much was the price of each adult ticket?	L

GROUP 2: Where do fish keep their money?

____	____	____	____	____	____	____	____	____
2	-1	10	8	2	-6	5	50	$\frac{1}{8}$

What value of z makes the equation $\frac{2}{3}z - \frac{1}{2} = -\frac{5}{12}$ true; $z = -1$, $z = 2$, $z = \frac{1}{8}$, $z = -\frac{1}{8}$?	K
Find the smaller of 2 consecutive even integers if the sum of twice the smaller integer and the larger integers is -16.	B
Twice the difference of a number and -3 is 4. Find the number.	I
Brooke is 3 years younger than Samantha. In five years the sum of their ages will be 29. Find Brooke's age.	E
Which of the following equations is equivalent to $4.12x + 5.2 = 8.23$? (1) $412x + 52 = 823$ (2) $412x + 520 = 823$ (3) $9.32x = 8.23$ (4) $0.412x + 0.52 = 8.23$	R
The length of a rectangle is twice the width. If the perimeter of the rectangle is 30 units, find the area of the garden?	N
A car travelling at 70 miles per hour travelled one hour longer than a truck travelling at 60 miles per hour. If the car and truck travelled a total of 330 miles, for how many hours did the car and truck travel all together?	A
Jeff sold half of his baseball cards then bought sixteen more. He now has 21 baseball cards. How many cards did he begin with?	V

GROUP 3: The more you take, the more you leave behind. What are they?

____	_____	_____	_____	_____	_____	_____	_____	_____
8	11.93	368	$1\frac{5}{6}$	10.50	$2\frac{1}{2}$	$3\frac{5}{6}$	21	4

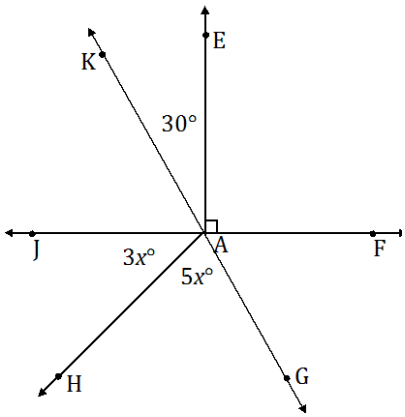
An apple has 80 calories. This is 12 less than $\frac{1}{4}$ the number of calories in a package of candy. How many calories are in the candy?	O
The ages of 3 brothers are represented by consecutive integers. If the oldest brother's age is decreased by twice the youngest brother's age, the result is -19. How old is the youngest brother?	P
A carpenter uses 3 hinges on every door he hangs. He hangs 4 doors on the first floor and x doors on the second floor. If he uses 36 hinges total, how many doors did he hang on the second floor?	F
Kate has $12\frac{1}{2}$ pounds of chocolate. She gives each of her 5 friends x pounds each and has $3\frac{1}{3}$ pounds left over. How much did she give each of her friends?	T
A room is 20 feet long. If a couch that is $12\frac{1}{3}$ feet long is to be centered in the room, how big of a table can be placed on either side of the couch?	E
Which equation is equivalent to $\frac{1}{4}x + \frac{1}{5} = 2$? (1) $4x + 5 = \frac{1}{2}$ (2) $\frac{2}{9}x = 2$ (3) $5x + 4 = 18$ (4) $5x + 4 = 40$	S
During a recent sale, the first movie purchased cost \$29 and each additional movie purchased costs m dollars. If Jose buys 4 movies and spends a total of \$64.80, how much did each additional movie cost?	O
The Hipster Dance company purchases 5 bus tickets that cost \$150 each, and they have 7 bags that cost b dollars each. If the total bill is \$823.50, how much does each bag cost?	S
The weekend before final exams, Travis studied 1.5 hours for his science exam, $2\frac{1}{4}$ hours for his math exam, and h hours each for Spanish, English, and Social Studies. If he spent a total of $11\frac{1}{4}$ hours studying, how much time did he spend studying for Spanish?	T

Name _____ Date_____

Lesson 10: Angle Problems and Solving Equations

Exit Ticket

In a complete sentence, describe the relevant angle relationships in the following diagram. That is, describe the angle relationships you could use to determine the value of x.



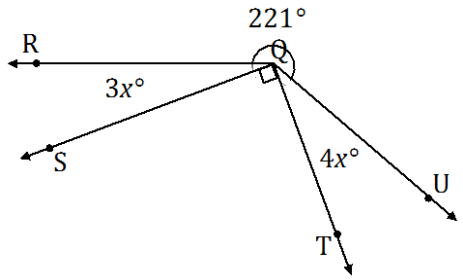
Use the angle relationships described above to write an equation to solve for x.

Name _____ Date_____

Lesson 11: Angle Problems and Solving Equations

Exit Ticket

Write an equation for the angle relationship shown in the figure and solve for x. Find the measures of $\angle RQS$ and $\angle TQU$.



Sprint – Round 1

Write the solution for each equation as quickly and accurately as possible within the allotted time.

1. $x + 1 = 5$		23. $\frac{1}{7}x = 5$	
2. $x + 2 = 5$		24. $\frac{2}{7}x = 10$	
3. $x + 3 = 5$		25. $\frac{3}{7}x = 15$	
4. $x + 4 = 5$		26. $\frac{4}{7}x = 20$	
5. $x + 5 = 5$		27. $-\frac{5}{7}x = -25$	
6. $x + 6 = 5$		28. $2x + 4 = 12$	
7. $x + 7 = 5$		29. $2x + 5 = 13$	
8. $x - 5 = 2$		30. $2x + 6 = 14$	
9. $x - 5 = 4$		31. $3x + 6 = 18$	
10. $x - 5 = 6$		32. $4x + 6 = 22$	
11. $x - 5 = 8$		33. $-x - 3 = -10$	
12. $x - 5 = 10$		34. $-x - 3 = -8$	
13. $3x = 15$		35. $-x - 3 = -6$	
14. $3x = 12$		36. $-x - 3 = -4$	
15. $3x = 6$		37. $-x - 3 = -2$	
16. $3x = 0$		38. $-x - 3 = 0$	
17. $3x = -3$		39. $2(x + 3) = 4$	
18. $-9x = 18$		40. $3(x + 3) = 6$	
19. $-6x = 18$		41. $5(x + 3) = 10$	
20. $-3x = 18$		42. $5(x - 3) = 10$	
21. $-1x = 18$		43. $-2(x - 3) = 8$	
22. $3x = -18$		44. $-3(x + 4) = 3$	

Sprint – Round 1

Write the solution for each equation as quickly and accurately as possible within the allotted time.

1. $x + 7 = 9$		23. $\frac{1}{5}x = 10$	
2. $x + 6 = 9$		24. $\frac{2}{5}x = 20$	
3. $x + 5 = 9$		25. $\frac{3}{5}x = 30$	
4. $x + 4 = 9$		26. $\frac{4}{5}x = 40$	
5. $x + 3 = 9$		27. $\frac{5}{5}x = 50$	
6. $x + 2 = 9$		28. $3x + 2 = 14$	
7. $x + 1 = 9$		29. $3x + 3 = 15$	
8. $x - 8 = 2$		30. $3x + 4 = 16$	
9. $x - 8 = 4$		31. $2x + 4 = 12$	
10. $x - 8 = 6$		32. $x + 4 = 8$	
11. $x - 8 = 8$		33. $-2x - 1 = 0$	
12. $x - 10 = 10$		34. $-2x - 1 = 2$	
13. $4x = 12$		35. $-2x - 1 = 4$	
14. $4x = 8$		36. $-2x - 1 = 6$	
15. $4x = 4$		37. $-2x - 1 = 7$	
16. $4x = 0$		38. $-2x - 1 = 8$	
17. $4x = -4$		39. $3(x + 2) = 9$	
18. $-8x = 24$		40. $4(x + 2) = 12$	
19. $-6x = 24$		41. $5(x + 2) = 15$	
20. $-3x = 24$		42. $5(x - 2) = -5$	
21. $-2x = 24$		43. $-3(2x - 1) = -9$	
22. $6x = -24$		44. $-5(4x + 1) = 15$	

Name _____ Date_____

Lesson 12: Properties of Inequalities

Exit Ticket

1. Given the initial inequality $-4 < 7$, state possible values for c that would satisfy the following inequalities:
   a. $c(-4) < c(7)$

   b. $c(-4) > c(7)$

   c. $c(-4) = c(7)$

2. Given the initial inequality $2 > -4$, identify which operation preserves the inequality symbol and which operation reverses the inequality symbol. Write the new inequality after the operation is performed.
   a. Multiply both sides by -2.

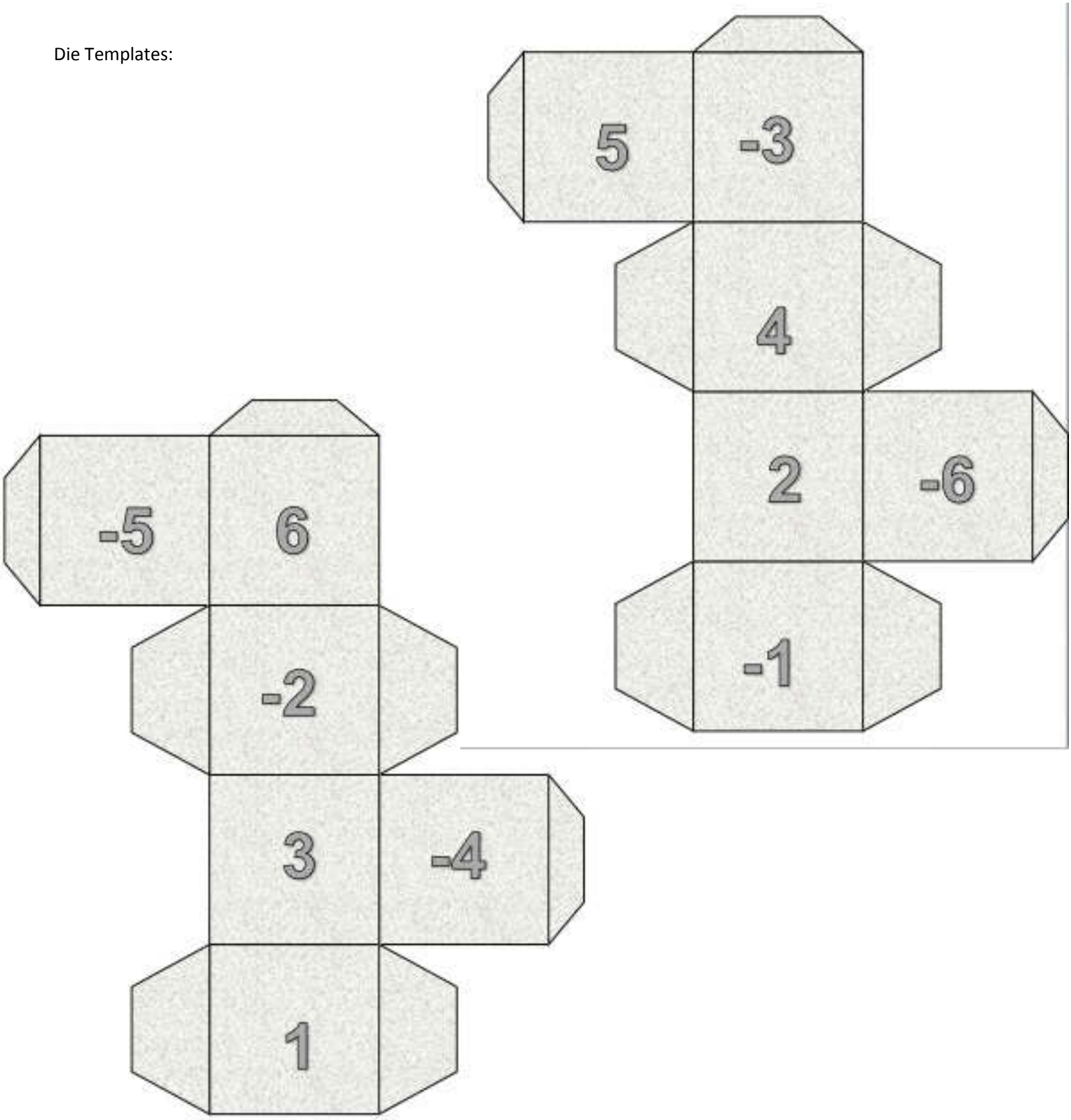
   b. Add -2 to both sides.

   c. Divide both sides by 2.

   d. Multiply both sides by $-\frac{1}{2}$.

   e. Subtract -3 from both sides.

Die Templates:



Name _____ Date_____

Lesson 13: Inequalities

Exit Ticket

Shaggy earned $7.55 per hour plus an additional $100 in tips waiting tables on Saturday. He earned at least $160 in all. Write an inequality and find the minimum number of hours, to the nearest hour, Shaggy worked on Saturday.

Name _____ Date_____

Lesson 14: Solving Inequalities

Exit Ticket

Games at the carnival cost $3 each. The prizes awarded to winners cost the owner $145.65. How many games must be played for the owner of the game to make at least $50?

Sprint – Round 1

Write the solution of each inequality.

1. $x+1>8$		23. $-\frac{1}{5}x>2$	
2. $x+2>8$		24. $-\frac{2}{5}x>2$	
3. $x+3>8$		25. $-\frac{3}{5}x>3$	
4. $x+4>8$		26. $-\frac{4}{5}x>4$	
5. $x-1>3$		27. $2x+4>8$	
6. $x-2>3$		28. $2x+5>9$	
7. $x-3>3$		29. $2x+6>10$	
8. $x-4>3$		30. $2x-1<5$	
9. $3x>15$		31. $2x-3<5$	
10. $3x>18$		32. $2x-5<5$	
11. $3x>21$		33. $-2x+1>7$	
12. $3x>24$		34. $-2x+2>-8$	
13. $-x>4$		35. $-2x+3>9$	
14. $-x>5$		36. $-3x+1>-8$	
15. $-x>6$		37. $-3x+1>10$	
16. $-x<-4$		38. $-3x+1>13$	
17. $-x<-5$		39. $2(x+3)>4$	
18. $-x<-6$		40. $3(x+3)<6$	
19. $\frac{1}{2}x>1$		41. $4(x+3)>8$	
20. $\frac{1}{2}x>2$		42. $-5(x-3)<-10$	
21. $\frac{1}{2}x>3$		43. $-2(x-3)>8$	
22. $\frac{1}{2}x>4$		44. $-2(x+3)<8$	

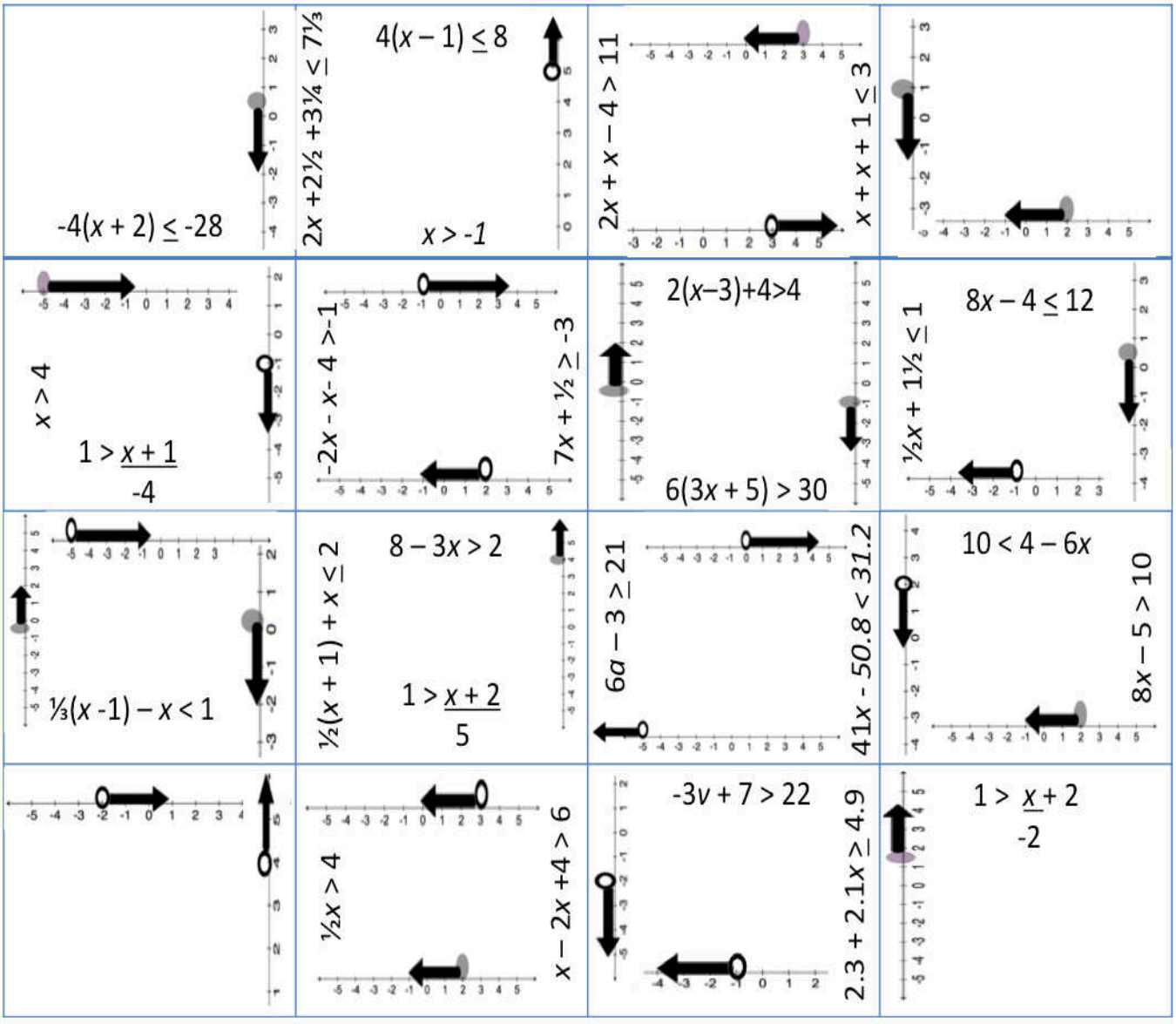
Sprint – Round 2

Write the solution of each inequality.

1. $x + 6 < 9$		23. $-\frac{1}{6}x < 2$	
2. $x + 5 < 9$		24. $-\frac{2}{6}x < 2$	
3. $x + 4 < 9$		25. $-\frac{3}{6}x < 3$	
4. $x + 3 < 9$		26. $-\frac{4}{6}x < 4$	
5. $x - 3 < 5$		27. $3x + 3 < 6$	
6. $x - 4 < 5$		28. $3x + 4 < 7$	
7. $x - 5 < 5$		29. $3x + 5 < 8$	
8. $x - 6 < 5$		30. $3x - 1 > 5$	
9. $4x < 20$		31. $3x - 4 > 5$	
10. $4x < 16$		32. $3x - 7 > 5$	
11. $4x < 12$		33. $-3x + 1 < 7$	
12. $4x < 8$		34. $-3x + 2 < -7$	
13. $-x < 6$		35. $-3x + 3 < 9$	
14. $-x < 5$		36. $-4x + 1 < -11$	
15. $-x < 4$		37. $-4x + 1 < -7$	
16. $-x < -8$		38. $-4x + 1 < -3$	
17. $-x < -7$		39. $3(x + 2) < 9$	
18. $-x < -6$		40. $4(x + 2) < 12$	
19. $\frac{1}{5}x < 1$		41. $5(x + 2) > 15$	
20. $\frac{1}{5}x < 2$		42. $-2(x + 1) < 4$	
21. $\frac{1}{5}x < 3$		43. $-3(2x - 1) < -9$	
22. $\frac{1}{5}x < 4$		44. $-5(4x + 1) < 15$	

Game or Additional Exercises (12 minutes)

Make copies of the puzzle below and cut the puzzle into 16 smaller squares. Mix up the pieces. Give each student a puzzle, and tell them to put the pieces together to form a 4×4 square. When pieces are joined, the problem on one side must be attached to the answer on the other. All problems on the top, bottom, right, and left must line up to the correct graph of the solution. The puzzle, how it is given below, is the answer key.



Name _____ Date_____

Lesson 15: Graphing Solutions to Inequalities

Exit Ticket

The junior-high art club sells candles for a fundraiser. The first week of the fundraiser the club sells 7 cases of candles. Each case contains 40 candles. The goal is to sell at least 13 cases. During the second week of the fundraiser, the club meets its goal. Write, solve, and graph an inequality that can be used to find the possible number of candles sold the second week.

Name _____ Date _____

1. Use the following expression below to answer parts (a) and (b).

$$4x - 3(x - 2y) + \frac{1}{2}(6x - 8y)$$

   a. Write an equivalent expression in standard form and collect like terms.

   b. Express the answer from part (a) as an equivalent expression in factored form.

2. Use the following information to solve the problems below.

   a. The largest side of a triangle is six more units than the smallest side. The third side is twice the smallest side. If the perimeter of the triangle is 25 units, write and solve an equation to find the lengths of all three sides of the triangle.

b. The length of a rectangle is $(x + 3)$ inches long, and the width is $3\frac{2}{5}$ inches. If the area is $15\frac{3}{10}$ square inches, write and solve an equation to find the length of the rectangle.

3. A picture $10\frac{1}{4}$ feet long is to be centered on a wall that is $14\frac{1}{2}$ feet long. How much space is there from the edge of the wall to the picture?

a. Solve the problem arithmetically.

b. Solve the problem algebraically.

c. Compare the approaches used in parts (a) and (b). Explain how they are similar.

4. In August, Cory begins school shopping for his triplet daughters.

   a. One day, he bought 10 pairs of socks for $\$2.50$ each and 3 pairs of shoes for d dollars each. He spent a total of $\$135.97$. Write and solve an equation to find the cost of one pair of shoes.

   b. The following day Cory returned to the store to purchase some more socks. He had $\$40$ to spend. When he arrived at the store, the shoes were on sale for $\frac{1}{3}$ off. What is the greatest amount of pairs of socks Cory can purchase if he purchased another pair of shoes in addition to the socks?

5. Ben wants to have his birthday at the bowling alley with a few of his friends, but he can spend no more than $\$80$. The bowling alley charges a flat fee of $\$45$ for a private party and $\$5.50$ per person for shoe rentals and unlimited bowling.

   a. Write an inequality that represents the total cost of Ben's birthday for p people given his budget.

   b. How many people can Ben pay for (including himself) while staying within the limitations of his budget?

   c. Graph the solution of the inequality from part (a).

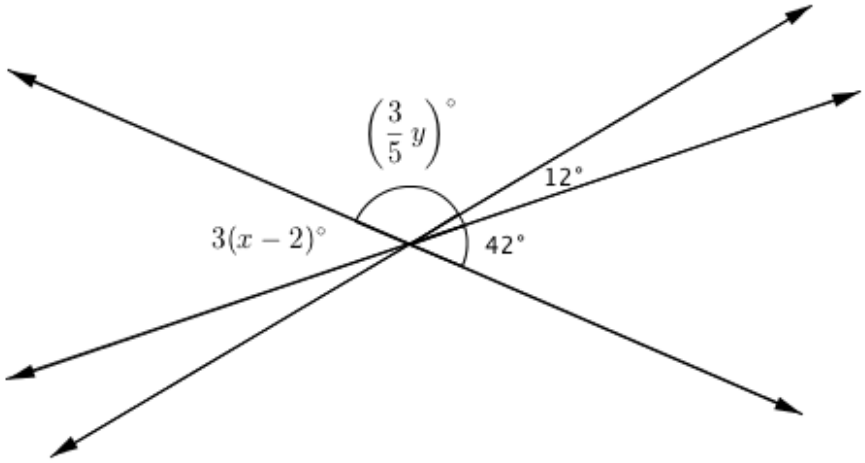
6. Jenny invited Gianna to go watch a movie with her family. The movie theater charges one rate for 3D admission and a different rate for regular admission. Jenny and Gianna decided to watch the newest movie in 3D. Jenny's mother, father, and grandfather accompanied Jenny's little brother to the regular admission movie.

   a. Write an expression for the total cost of the tickets. Define the variables.

   b. The cost of the 3D ticket was double the cost of the regular admission ticket. Write an equation to represent the relationship between the two types of tickets.

   c. The family purchased refreshments and spent a total of $\$18.50$. If the total amount of money spent on tickets and refreshments were $\$94.50$, use an equation to find the cost of one regular admission ticket.

7. The three lines shown in the diagram below intersect at the same point. The measures of some of the angles in degrees are given as $3(x-2)°$, $\left(\frac{3}{5}y\right)°$, $12°$, $42°$.



a. Write and solve an equation that can be used to find the value of x.

b. Write and solve an equation that can be used to find the value of y.

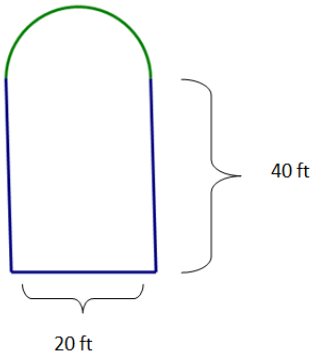
Name _____ Date_____

Lesson 16: The Most Famous Ratio of All

Exit Ticket

Brianna's parents built a swimming pool in the back yard. Brianna says that the distance around the pool is 120 feet.

1. Is she correct? Explain why or why not.



2. Explain how Brianna would determine the distance around the pool so that her parents would know how many feet of stone to buy for the edging around the pool.

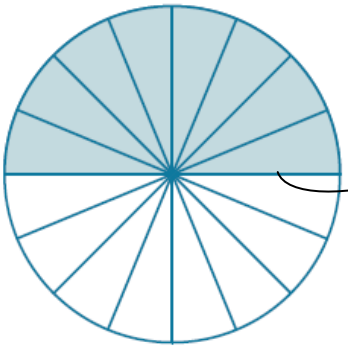
3. Explain the relationship between the circumference of the semicircular part of the pool and the width of the pool.

Name _____ Date_____

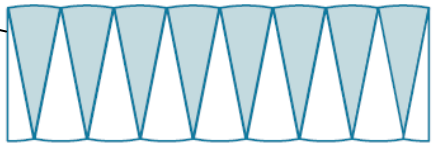
Lesson 17: The Area of a Circle

Exit Ticket

Complete each statement using the words or algebraic expressions listed in the word bank below.



1. The length of the _____ of the rectangular region approximates the length of the _____ of the circle.



2. The_____ of the rectangle approximates the length as one-half of the circumference of the circle.

3. The circumference of the circle is _____.

4. The _____ of the _____ is $2r$.

5. The ratio of the circumference to the diameter is _____.

6. Area (circle) = Area of (_____) = $\frac{1}{2}$·circumference· $r = \frac{1}{2}(2\pi r) \cdot r = \pi \cdot r \cdot r =$ _____.

Word bank					
Radius	**Height**	**Base**	$2\pi r$	**Diameter**	**Circle**
Rectangle	πr^2	π			

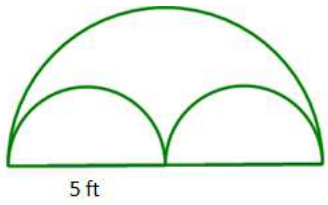
Name _____ Date_____

Lesson 18: More Problems on Area and Circumference

Exit Ticket

1. Ken's landscape gardening business creates odd shaped lawns which include semicircles. Find the area of this semicircular section of the lawn in this design. Use $\frac{22}{7}$ for π.

2. In the figure below, Ken's company has placed sprinkler heads at the center of the two small semicircles. The radius of the sprinklers is 5 ft. If the area in the larger semicircular area is the shape of the entire lawn, how much of the lawn will not be watered? Give your answer in terms of π and to the nearest tenth. Explain your thinking.

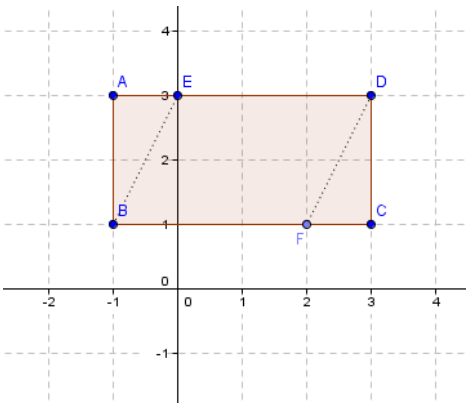


Name _____ Date _____

Lesson 19: Unknown Area Problems on the Coordinate Plane

Exit Ticket

The figure $ABCD$ is a rectangle. $AB = 2$ units, $AD = 4$ units, and $AE = FC = 1$ unit.



1. Find the area of rectangle $ABCD$.

2. Find the area of triangle ABE.

3. Find the area of triangle DCF.

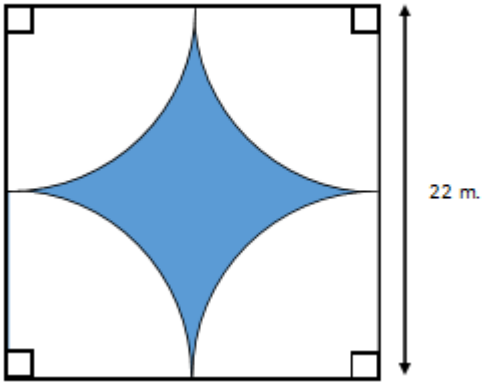
4. Find the area of the parallelogram $BEDF$ two different ways.

Name _____ Date _____

Lesson 20: Composite Area Problems

Exit Ticket

The unshaded regions are quarter circles. Find the area of the shaded region. Use $\pi \approx 3.14$.

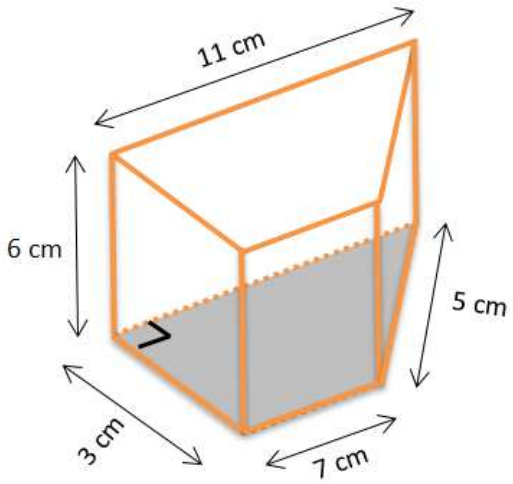


Name _____ Date _____

Lesson 21: Surface Area

Exit Ticket

Find the surface area of the right trapezoidal prism. Show all necessary work.

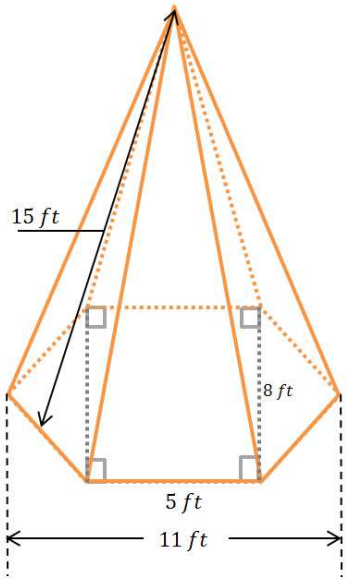


Name _____ Date _____

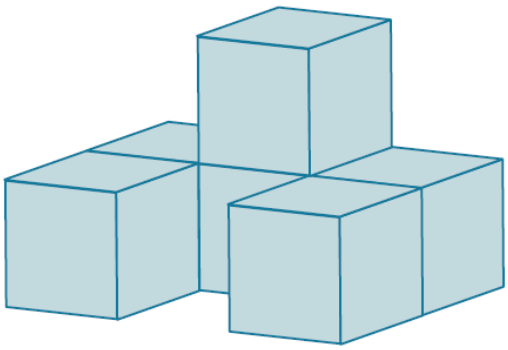
Lesson 22: Surface Area

Exit Ticket

1. The right hexagonal pyramid has a hexagon base with equal length sides. The lateral faces of the pyramid are all triangles (that are exact copies of one another) with heights of 15 ft. Find the surface area of the pyramid.



2. Six cubes are glued together to form the solid shown in the diagram. If the edges of each cube measure $1\frac{1}{2}$ inches in length, what is the surface area of the solid?

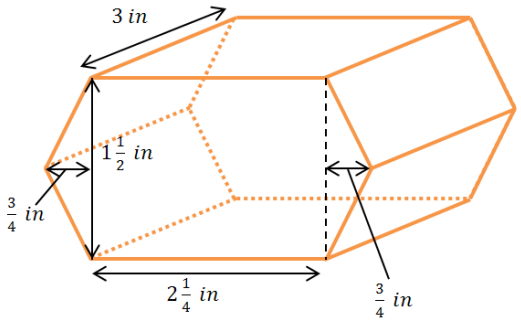


Name _____ Date _____

Lesson 23: The Volume of a Right Prism

Exit Ticket

The base of the right prism is a hexagon composed of a rectangle and two triangles. Find the volume of the right hexagonal prism using the formula $V = Bh$.



Name _____ Date _____

Lesson 24: The Volume of a Right Prism

Exit Ticket

1. Lawrence poured 27.328 liters of water into a right rectangular prism-shaped tank. The base of the tank is 40 cm by 28 cm. When he finished pouring the water, the tank was $\frac{2}{3}$ full. (1 liter$= 1000$ cm^3)

   a. How deep is the water in the tank?

   b. How deep is the tank?

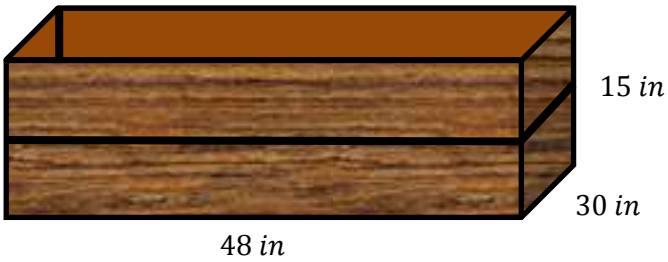
   c. How many liters of water can the tank hold in total?

Name _____ Date _____

Lesson 25: Volume and Surface Area

Exit Ticket

1. Melody is planning a raised bed for her vegetable garden.



a. How many square feet of wood does she need to create the bed?

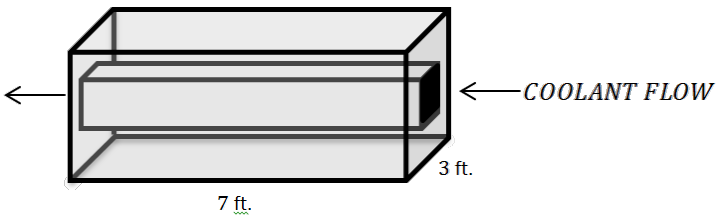
b. She needs to add soil. Each bag contains 1.5 cubic feet. How many bags will she need to fill the vegetable garden?

Name _____ Date _____

Lesson 26: Volume and Surface Area

Exit Ticket

1. Lawrence is designing a cooling tank that is a square prism. A pipe in the shape of a smaller $2\ ft. \times 2\ ft.$ square prism passes through the center of the tank as shown in the diagram, through which a coolant will flow.



   a. What is the volume of the tank including the cooling pipe?

   b. What is the volume of coolant that fits inside the cooling pipe?

   c. What is the volume of the shell (the tank not including the cooling pipe)?

   d. Find the surface area of the cooling pipe.

Name _____ Date _____

1. Gloria says the two expressions $\frac{1}{4}(12x + 24) - 9x$ and $-6(x + 1)$ are equivalent. Is she correct? Explain how you know.

2. A grocery store has advertised a sale on ice cream. Each carton of any flavor of ice cream costs $\$3.79$.

   a. If Millie buys a combination of strawberry ice cream and chocolate ice cream cartons, write an algebraic expression that represents the total cost of buying the ice cream.

   b. Write an equivalent expression for your answer in part (a).

   c. Explain how the expressions are equivalent.

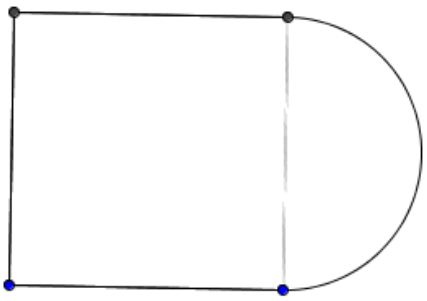
3. A new park was designed to contain two circular gardens. Garden A has a diameter of 50 m, and the garden B has a diameter of 70 m.

   a. If the Gardner wants to outline the gardens in edging, how many meters will be needed to outline the smaller garden? (Write in terms of π.)

   b. How much more fencing will be needed for the larger garden than the smaller one? (Write in terms of π.)

   c. The Gardner wishes to put down weed block fabric on the two gardens before the plants are planted in the ground. How much fabric will be needed to cover the area of both gardens? (Write in terms of π.)

4. A play court on the school playground is shaped like a square joined by a semi-circle. The perimeter around the entire play court is 182.8 ft., and 62.8 ft. of the total perimeter comes from the semi-circle.

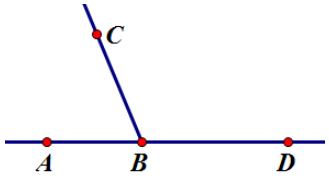


a. What is the radius of the semi-circle?

b. The school wants to cover the play court with sports court flooring. Using 3.14 for π, how many square feet of flooring does the school need to purchase to cover the play court?

5. Marcus drew two adjacent angles.

   a. If $\angle ABC$ has a measure one-third of $\angle CBD$, then what is the degree measurement of $\angle CBD$?



   b. If $\angle CBD = 9(8x + 11)$ degrees, then what is the value of x?

6. The dimensions of an above-ground, rectangular pool are 25 feet long, 18 feet wide and 6 feet deep.

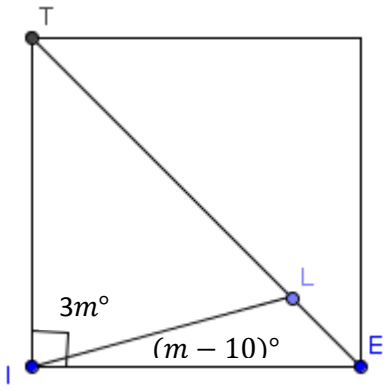
   a. How much water is needed to fill the pool?

b. If there are 7.48 gallons in 1 cubic foot, how many gallons are needed to fill the pool?

c. Assume there was a hole in the pool, and 3366 gallons of water leaked from the pool. How many feet did the water level drop?

d. After the leak was repaired, it was necessary to resurface (lay a thin layer of concrete to protect) the sides of the pool. Calculate the area to be covered to complete the job.

7. Gary is learning about mosaics in Art class. His teacher passes out small square tiles and encourages the students to cut up the tiles in various angles. Gary's first cut tile looks like this:



a. Write an equation relating $\angle TIL$ with $\angle LIE$.

b. Solve for m.

c. What is the measure of $\angle TIL$?

d. What is the measure of $\angle LIE$?