3.1 Linear Equations, Part 1:

- **Linear Equations**: A linear equation is any equation that includes constants and variables that are multiplied by coefficients. Linear Equations are often used to model real world patterns and situations.
  - **To be a linear equation, the "x" variable has to have an exponent of 1.**
  - **To solve linear equations, use the properties of equality. Each property (one for each operation) states that whatever you do to one side of an equation, you must do the same thing to the other side of the equation.**
  - **When solving linear equations, use Reverse Order of Operations.**
    - **Remove parenthesis first (distributive property).**
    - **Collect like terms**
    - **Isolate the variable.**

EX – Solve $4x - (3x - 5) = 2x + 11$

3.2 Linear Equations, Part 2:

- **Linear Equations with 2 variables:** The solutions to linear equations with 2 variables are ordered pairs of numbers (x, y).
- **Three forms of linear equations:**
  - **Slope-Intercept Form – $y = mx + b$ (where m is the slope and b is the y-intercept)**
  - **Point-Slope Form – $y - y_1 = m(x - x_1)$ (where m is the slope and (x_1, y_1) is a point on the line.**
  - **Standard Form – $Ax + By = C$**
  - To convert to slope-intercept form, use reverse order of operations to isolate the y.

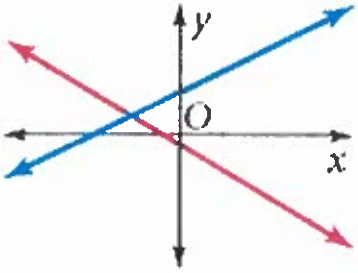
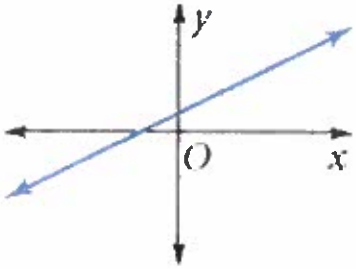
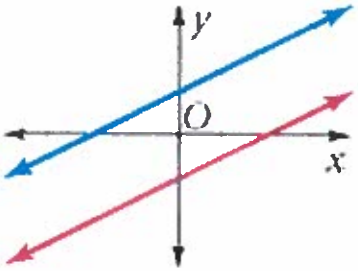
EX – Convert $3x + 5y = 10$ to slope-intercept form.

- **In real world problems, it's important to know what "x" and "y" represent in the problem. The solution to these problems will mean something in context of the problem, and the final answer may require you to identify exactly what the ordered pair means.**

3.3 Systems of Linear Equations

- **Systems of Linear Equations:** Has two or more linear equations. The solution to a system of linear equations is the ordered pair that satisfies both equations (i.e. – makes both equations true).
- **3 Ways to Solve Systems of Linear Equations:**
  - **Solve by Graphing:** To solve a system of linear equations by graphing, follow these steps:
    1. Convert both equations to slope-intercept form.
    2. Graph both equations (start with your "b" and use your slope to graph every point possible)
    3. The ***INTERSECTION*** point is the solution to the system.

3 Possible types of solutions:

Intersecting Lines	Coinciding Lines	Parallel Lines
		
one solution	no unique solution	no solution
Independent	**Dependent**	**Inconsistent**

  - **Solve by Substitution:** To solve using substitution, follow these steps:
    1. Look for an already isolated variable
    2. If none, find a coefficient of 1.
    3. Isolate the variable that has the coefficient of 1 (either x or y).
    4. Plug the expression that it's equal to into the opposite equation for that variable (it "substitutes" or replaces that variable)
    5. Solve for the remaining variable.
    6. Plug that solution into either of the original equations to find remaining variable solution.

EX – Solve the system using substitution.

$$\begin{cases} -x + y = 40 \\ y = 5x + 80 \end{cases}$$

- **Solve by Elimination:** To solve using elimination, follow these steps:
  1. Look for additive inverse coefficients (add equations together to eliminate the variable)
  2. Look for same coefficients (multiply one equation by -1, then add equations together)
  3. Look for Multiples (multiply one equation by whatever would make it into the additive inverse of the multiple, then add equations together)
  4. If none of the above, multiply both equations by numbers that would get additive inverse Least Common Multiples, then add equations together.
  5. Once equations are added to "eliminate" or get rid of a variable, solve equation for remaining variable.
  6. Plug that number back into one of the original equations to find remaining variable.

EX – Solve the system of equations using elimination.

$$\begin{cases} x + 2y = 5 \\ 3x + 3y = 6 \end{cases}$$

**** NOTE – For both Substitution and Elimination, if both variables "cancel out", check to see if the remaining part is true or false. If true (ex – 0 = 0), then there are infinitely Many Solutions (same line). If False (ex – 0 = 12), then there is no solution (the lines are parallel)****

Try this sample question.

5-3 What value of x makes the equation below true?

$$4x - (3x - 5) = 2x + 11$$

To find the value of x in this equation, first simplify the left side of the equation. Then combine variable terms onto one side, as shown in the steps below:

$4x - (3x - 5) = 2x + 11$	
$4x - 3x + 5 = 2x + 11$	Distribute -1 to eliminate parentheses.
$x + 5 = 2x + 11$	Combine like terms.
$5 = x + 11$	Subtract x from both sides.
$-6 = x$	Subtract 11 from both sides.

When $x = -6$, the equation is true.

IT'S YOUR TURN

Read each problem. Circle the letter of the best answer.

1. Three friends share the cost of a pizza. The base price of the pizza is p and the extra toppings cost $4.50. If each person's share was $7.15, which equation could be used to find p, the base price of the pizza?

   A $7.15 = 3p - 4.5$

   B $7.15 = \frac{1}{3}p + 4.5$

   C $7.15 = 3(p + 4.5)$

   D $7.15 = \frac{1}{3}(p + 4.5)$

2. What is the solution to the linear equation $-6z + 1 = 13$?

   A $z = -6$

   B $z = -2$

   C $z = 2$

   D $z = 6$

3. Felix buys a carpet for $230. The price is $3.50 per square foot. If Felix had a special discount coupon for $50 off, which linear equation could be used to find the area, A, of the carpet?

   A $230 = 3.5A + 50$

   B $50 = 3.5A - 230$

   C $230 = 3.5A - 50$

   D $50 = 230 - 3.5A$

Read each problem. Circle the letter of the best answer.

4. Lia uses the equation below to estimate the amount of taxes, T, she owes to the government.

$$T = 0.15(d - 7{,}550) + 755$$

Lia estimates that she owes the government \$3,455 in taxes. What is d, the total dollars Lia earned during the past year?

A \$15,755

B \$20,550

C \$25,550

D \$30,755

5. The steps Derek used to solve an equation are shown below.

Solve: $0.4x + 5 + 0.2x = 17$

Step 1: $0.4x + 0.2x + 5 = 17$
Step 2: $0.6x + 5 = 17$
Step 3: $0.6x = 12$
Step 4: $x = 20$

Which properties justify Step 1 and Step 3?

A Step 1: Distributive Property
Step 3: Division Property of Equality

B Step 1: Distributive Property
Step 3: Subtraction Property of Equality

C Step 1: Commutative Property of Addition
Step 3: Division Property of Equality

D Step 1: Commutative Property of Addition
Step 3: Subtraction Property of Equality

6. A restaurant meal for a group of people cost \$85 total. This amount included a 6% tax and an 18% tip, both based on the price of the food. Which equation could be used to find f, the cost of the food?

A $85 = 0.24c$

B $85 = 1.06f + 0.18$

C $85 = f + 0.24$

D $85 = 1.24f$

7. What is the solution to the linear equation $\frac{3}{4}y - 5 = 10$?

A $y = \frac{15}{4}$

B $y = \frac{20}{3}$

C $y = \frac{45}{4}$

D $y = 20$

8. A tilesetter is joining two tiles to make a 90° angle. The degree measure of tile A can be represented as $3y + 2$ and of tile B as $5y$. Which equation below is **not** a step in finding the size of each angle?

A $88 = 8y - 2$

B $90 = 8y + 2$

C $\frac{1}{8} \cdot 88 = \frac{1}{8} \cdot y$

D $90 = 3y + 2 + 5y$

Read each problem. Circle the letter of the best answer.

9. Tara is solving an equation. Her first step is shown below.

Solve: $4y - 8(y - 2) = 6$

Step 1: $4y - 8y + 16 = 6$

Which property justifies Tara's first step?

A Identity Property

B Distributive Property

C Subtraction Property of Equality

D Associative Property of Multiplication

10. One-fourth the distance between two cities is 100 miles less than two-thirds the distance between the cities. Which equation expresses this situation?

A $\frac{1}{4}d - 100 = \frac{2}{3}d$

B $\frac{1}{4}d = \frac{2}{3}d - 100$

C $\frac{1}{4}d = \frac{2}{3}d + 100$

D $\frac{1}{4}d - \frac{2}{3}d = 100$

11. Which is a correct step in solving the following equation for g?

$$-1.75 + 2(2 - g) = 0$$

A $2(2 - g) = -1.75$

B $4 - g = 1.75$

C $-2g = 1.75 - 4$

D $g = -2.25 \div 2$

12. Arturo is going to solve this equation.

$$\frac{5}{8}(x - 4) = \frac{3}{4}(x + 2)$$

Which statement best describes a correct strategy for the first two steps?

A 1. Add 4 to both sides using the Addition Property of Equality.
2. Eliminate the parentheses using the Distributive Property.

B 1. Add 4 to both sides using the Addition Property of Equality.
2. Eliminate the parentheses using the Commutative Property.

C 1. Multiply both sides by 8 using the Multiplication Property of Equality.
2. Eliminate the parentheses using the Distributive Property.

D 1. Multiply both sides by 8 using the Multiplication Property of Equality.
2. Eliminate the parentheses using the Commutative Property.

IT'S YOUR TURN

Read each problem. Circle the letter of the best answer.

1. Jackson has 75¢ in dimes, d, and nickels, n, in his pocket. Which equation could be solved to find the possible combinations of dimes and nickels Jackson has?

   A $75 = d + n$

   B $75 = dn$

   C $75 = 10d \cdot 5n$

   D $75 = 10d + 5n$

2. The linear equation below has two variables.

$$y = -\frac{1}{4}x - 1$$

   Which shows the solutions to the equation when $x = 4$, $x = 0$, and $x = -4$?

   A $(-2, 4), (1, 0), (0, -4)$

   B $(4, -2), (0, -1), (-4, 0)$

   C $(2, -4), (-1, 0), (0, 4)$

   D $(-4, 2), (0, 1), (4, 0)$

3. A 50-foot roll of fencing will be used to enclose a rectangular garden. Which equation below could **not** be solved to find the possible lengths, l, and widths, w, of the garden?

   A $50 = 2lw$

   B $\frac{50}{2} = l + w$

   C $2(l + w) = 50$

   D $50 = 2l + 2w$

4. Ms. Monti bought x adult tickets and y children's tickets to an ice-skating show. She spent a total of \$145. The equation below describes the relationship between x and y.

$$25x + 15y = 145$$

   The ordered pair $(4, 3)$ is a solution of the equation. What does the solution $(4, 3)$ represent?

   A Ms. Monti bought 4 adult tickets and 3 children's tickets.

   B Adult tickets cost \$4 each and children's tickets cost \$3 each.

   C Ms. Monti spent \$4 on adult tickets and \$3 on children's tickets.

   D The cost of 4 adult tickets equals the cost of 3 children's tickets.

5. Look at the linear equation below.

$$-1.5x - 10y = 5$$

   What is the value of y when $x = 6$?

   A 1.4

   B 0.9

   C -0.9

   D -1.4

Read each problem. Circle the letter of the best answer.

6. The growth of a kitten is described by the equation $y = 2.5x + 4$, where y represents the kitten's weight in ounces x weeks after it was born. What is the meaning of the fact that the point (4, 14) lies on the graph of the equation?

   A The kitten had an initial weight of 4 ounces.

   B The kitten is growing at a rate of 4 ounces per week.

   C The kitten weighed 4 ounces when it was 14 weeks old.

   D The kitten weighed 14 ounces when it was 4 weeks old.

7. Jorge earns $12 an hour. Deductions for taxes and insurance take 25% of his earnings. Which equation could be solved to find Jorge's take-home pay, p, after h hours of work?

   A $p = 12h - 0.25$

   B $p - 0.25h = 12h$

   C $p = (0.75)12h$

   D $p = (12 - 0.25)h$

8. Look at the linear equation below.

   $$2x - 3y = -13$$

   Which pair of numbers is a solution to the equation?

   A (-5, -1)

   B (-5, 1)

   C (5, -1)

   D (5, 1)

9. For which linear equation below is (-7.5, -2.5) a solution?

   A $y = -3x$

   B $y = -\frac{1}{3}x$

   C $y = 3x$

   D $y = \frac{1}{3}x$

10. The lengths in inches (x and y) of two fish are related by the equation $5x - 4y = 24$. The two ordered pairs below are solutions to the equation.

    (4, -1) (12, 9)

    Which statement best evaluates whether these two solutions make sense in this situation?

    A Both solutions make sense in this situation.

    B Neither solution makes sense in this situation.

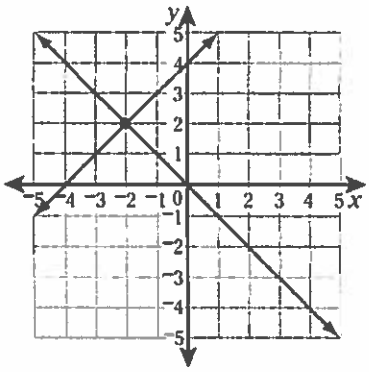
    C The solution (4, -1) makes sense in this situation, but (12, 9) does not.

    D The solution (12, 9) makes sense in this situation, but (4, -1) does not.

IT'S YOUR TURN

Read each problem. Circle the letter of the best answer.

1. What is the solution to the system of equations graphed below?



A (-4, 0)

B (-2, 2)

C (0, 0)

D (0, 4)

2. Look at this system of equations.

$$\begin{cases} y = 2x - 1 \\ 4x + y = 2 \end{cases}$$

Which shows a correct step in using substitution to solve the system of equations?

A $4x + y = 2x - 1$

B $4x + 2x - 1 = 2$

C $6x - 2 = y$

D $6x + 2 = 2y$

3. What is the solution to the system of equations shown below?

$$\begin{cases} 2x + 2y = 12 \\ 6x - 2y = 20 \end{cases}$$

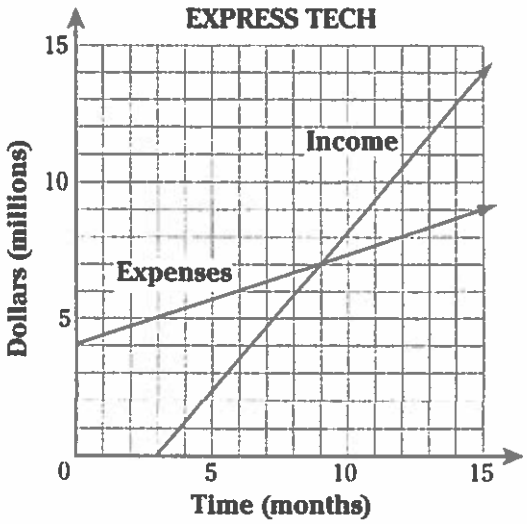
A (0, 6)

B (2, 2)

C (3, 3)

D (4, 2)

4. A new company's expenses and income are graphed below.



When did the company start to make as much money as it spent?

A 3 months

B 4 months

C 9 months

D 16 months

Read each problem. Circle the letter of the best answer.

5. Dani bought a total of 8 pounds of peanuts and cashews. Peanuts, p, cost \$2 per pound and cashews, c, cost \$5 per pound. The total amount Dani spent on the peanuts and cashews was \$25. Which system of equations could be solved to find how many pounds of peanuts Dani bought?

A $\begin{cases} 2p + 5c = 25 \\ p + c = 8 \end{cases}$

B $\begin{cases} 5p + 2c = 25 \\ p + c = 8 \end{cases}$

C $\begin{cases} 2p + 5c = 8 \\ p + c = 25 \end{cases}$

D $\begin{cases} 2p = 8 \\ 5c = 25 \end{cases}$

6. Study the system of equations below.

$$\begin{cases} x + y = -4 \\ x - y = 10 \end{cases}$$

What is the solution to the system of equations?

A (-4, 10)

B (10, 4)

C (3, -7)

D (7, -3)

7. A postage stamp is shaped like a rectangle with a perimeter of 88 millimeters. The length (x) is 10 millimeters less than twice the width (y). The system of equations shown below represents this situation.

$$\begin{cases} x = 2y - 10 \\ 2x + 2y = 88 \end{cases}$$

Which statement is true?

A The width of the stamp is 12 millimeters.

B The length of the stamp is 36 millimeters.

C The width of the stamp is 8 millimeters less than the length.

D The length of the stamp is 10 millimeters greater than the width.

8. What is the y-value of the solution to the system of equations shown below?

$$\begin{cases} 5x + 4y = 12 \\ -5x - 2y = -16 \end{cases}$$

A -4

B -2

C 2

D 4

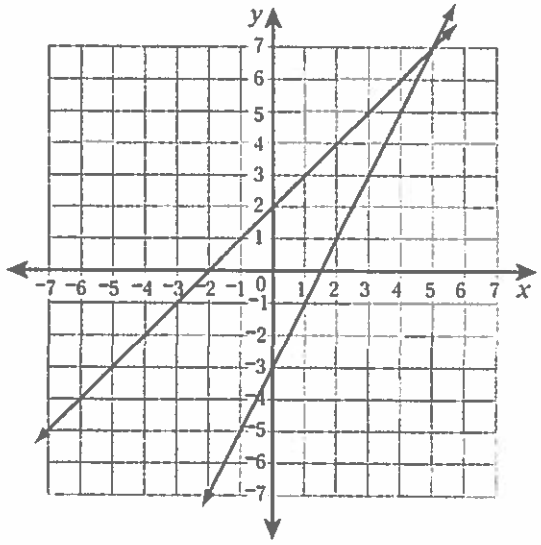
Read the problem. Circle the letter of the best answer.

9. Look at the system of equations below.

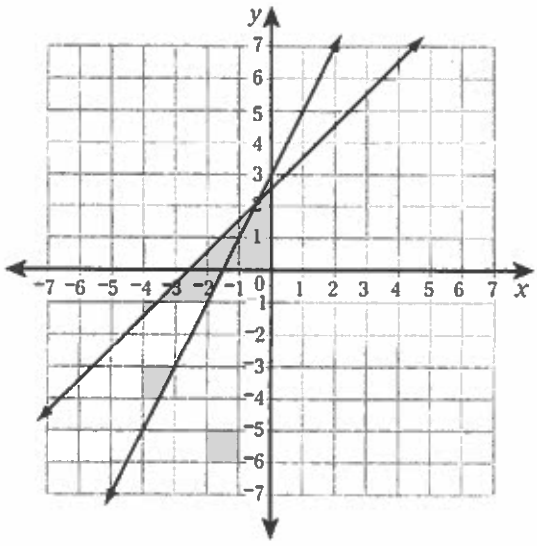
$$\begin{cases} y = x + 2 \\ y = 2x - 3 \end{cases}$$

Which coordinate plane shows the solution to this system of equations?

A



C



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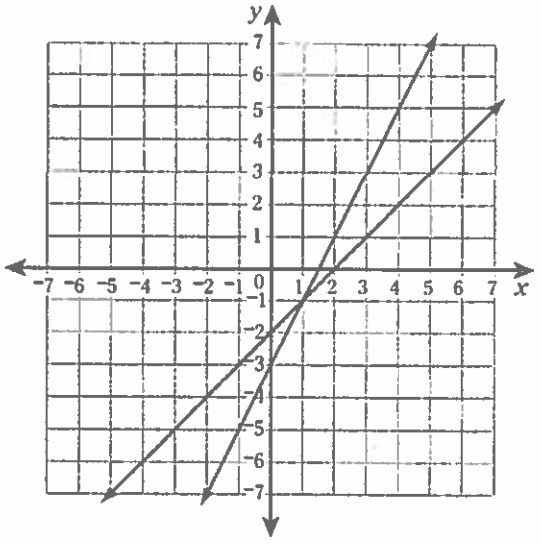

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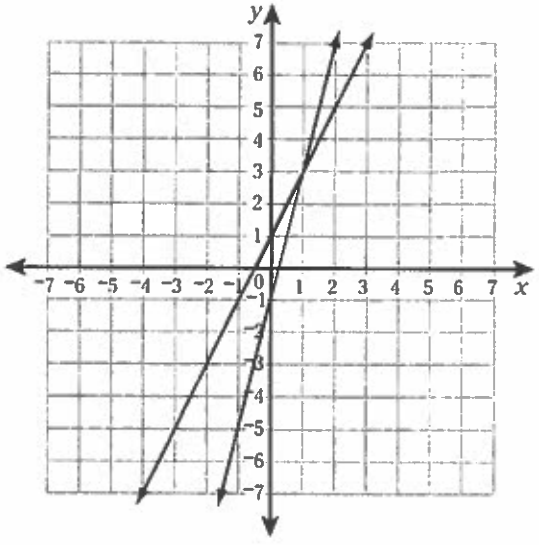


Read each problem. Circle the letter of the best answer.

10. Nathan mixed x quarts of milk containing 2% fat with y quarts of milk containing 4% fat. The total amount of the mixture was 9 quarts, and it contained a total of 0.24 quart of fat. This situation is represented by the system of equations shown below.

$$\begin{cases} x + y = 9 \\ 0.02x + 0.04y = 0.24 \end{cases}$$

Which statement is true?

A Nathan used twice as much 2% milk as 4% milk.

B Nathan used twice as much 4% milk as 2% milk.

C Nathan used 2 quarts more 2% milk than 4% milk.

D Nathan used 2 quarts more 4% milk than 2% milk.

11. Mr. Santana is 3 times his daughter Kara's age. Ten years ago, Mr. Santana was 7 times Kara's age. Which system of equations could you solve to find Mr. Santana's current age?

A $\begin{cases} 3f = d \\ f - 10 = 7d - 10 \end{cases}$

B $\begin{cases} f = 3d \\ f + 10 = 7(d + 10) \end{cases}$

C $\begin{cases} f = \frac{d}{3} \\ f + 10 = 7d - 10 \end{cases}$

D $\begin{cases} f = 3d \\ f - 10 = 7(d - 10) \end{cases}$

12. Molly is selling bracelets and necklaces at a craft fair. The cost of 4 bracelets and 3 necklaces is \$23.50. The cost of 5 bracelets and 2 necklaces is \$21.50. The system of equations shown below represents this situation.

$$\begin{cases} 4b + 3n = 23.50 \\ 5b + 2n = 21.50 \end{cases}$$

A customer bought 1 bracelet and 1 necklace. How much money did the customer spend?

A \$6.50

B \$7.00

C \$7.50

D \$8.00

Unit 3 Constructed-Response Review

Read the problem. Write your answer for each part.

1. Vic and Eva buy used cars at the same time. Vic buys a car with 10,000 miles on it. He drives an average of 100 miles a week. The equation below can be used to determine how many miles, m, will be on the car after any number of weeks of driving, w.

$$m = 100w + 10{,}000$$

A In how many weeks will Vic's car have 12,000 miles on it?

Answer: _____

Eva buys a car with 7,000 miles on it. She drives an average of 400 miles a week.

B Use the system of equations below to find in how many weeks Vic's and Eva's cars will have the same number of miles on them.

$$\begin{cases} m = 100w + 10{,}000 \\ m = 400w + 7{,}000 \end{cases}$$

Answer: _____

C How many miles, m, will the cars have on them when the number of weeks, w, is the same? Use the system of equations from **part B.** Show how you found your answer.

Answer: _____

Read the problem. Write your answer for each part.

2. Padma rented a bike for x hours and a kayak for y hours while she was on vacation.

   A She rented the bike and kayak for a total of 7 hours. Write an equation to represent this situation.

Answer: _____

The bike cost $6 an hour and the kayak cost $10 an hour. Padma spent a total of $60 for the bike and kayak rentals.

B Write an equation to represent this situation.

Answer: _____

How many hours did Padma rent the kayak? Show or explain your work.

Answer: _____

Read the problem. Write your answer for each part.

3. The table shows how the length of Alex's pet lizard is changing over time.

PET LIZARD GROWTH

Age (years)	Length (centimeters)
1	5.0
2	7.4
3	9.8
4	12.2
5	14.6

A Write an equation using x and y to find the length of the lizard based on its age.

Answer: _____

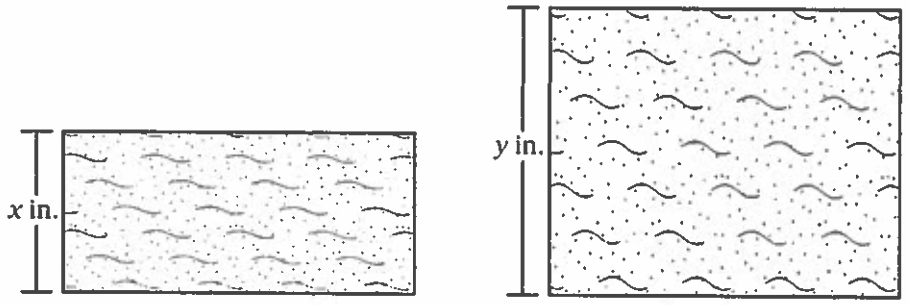
B Describe what the x and y variables represent in your equation.

c. Use your equation to predict the length of the lizard when it is 12 years old. Show your work.

Answer: _____

Read the problem. Write your answer for each part.

4. Rosalina has two sizes of bricks to use to build a wall, as shown below.



If Rosalina stacks 3 small bricks and 2 large bricks, the total height is 26 inches. If she stacks 5 small bricks and 3 large bricks, the total height is 41 inches. Rosalina wrote the system of equations shown below to represent this situation.

$$\begin{cases} 3x + 2y = 26 \\ 5x + 3y = 41 \end{cases}$$

A To solve the system, Rosalina's first step was to multiply both sides of the first equation by 3. What algebraic property justifies that step?

Answer: _____

B Complete Rosalina's work and solve the system of equations. Show and explain each step of your work.

C Explain what the solution to the system of equations means in this situation.

Read the problem. Write your answer for each part.

5. Ms. Chen is buying a printer for her computer. She needs to choose between two different brands, the Voltroxx printer and the Inkwest printer. For whichever printer she buys, she will also need to buy ink cartridges. Information about the two printers is shown in the table below.

PRINTER COMPARISON

Brand of Printer	Cost of Printer	Cost of Ink Cartridges
Voltroxx	$50	$30 each
Inkwest	$80	$27 each

A Write a system of linear equations that relates Ms. Chen's total cost to the number of cartridges needed.

Answer: _____

B What is the solution to this system of equations? Show your work.

Answer: _____

C What does the solution to this system of equations represent in the context of the problem?

D. *Sample explanation:* The number of kiosks rounds to 30,000, and the number of movies rented each week rounds to 9.6 million. Dividing the number of movies, 9.6 million, by the number of kiosks, 30,000, gives a quotient of 320 movies per machine each week. 52 weeks a year rounds to 50, and multiplying 320 by 50 yields a product of 16,000 movies per kiosk a year.

3. [A1.1.1.5.1]
   A. $10x + 8$ cm
   B. $6x^2 + 5x - 21$ cm^2
   C. $2x^2 + 15x - 79$ cm^2
   Sample work:
   Area of size B $= (4x - 10)(2x + 10)$
   $= 8x^2 + 40x - 20x - 100$
   $= 8x^2 + 20x - 100$ cm^2
   Difference of A and B
   $= (8x^2 + 20x - 100) - (6x^2 + 5x - 21)$
   $= (8x^2 + 20x - 100) + (-6x^2 - 5x + 21)$
   $= 2x^2 + 15x - 79$ cm^2
4. [A1.1.1.5.2]
   A. $(x + 6)(x + 4)$
   B. *Sample explanation:* I knew the factorization would be $(x - a)(x + b)$, where the numbers a and b would have a product of 24 and a sum of 10. I listed all the pairs of numbers that have a product of 24, and found the two that have a sum of 10, which are 6 and 4. That gave me the answer: $(x + 6)(x + 4)$.
   C. $(x - 6)(x - 4)$
   D. *Sample explanation:* No, it's not possible. To factor $x^2 - mx + n$, the product of a and b must be n, which is positive. But if $a > 0$ and $b < 0$, then the product ab will be negative.
5. [A1.1.1.5.3]
   A. $\frac{5(n-3)}{n+6}$
   Sample work:
   $\frac{20n^2 - 180}{4n^2 + 36n + 72} = \frac{20(n^2 - 9)}{4(n^2 + 9n + 18)} =$
   $\frac{20(n+3)(n-3)}{4(n+3)(n+6)} = \frac{5(n-3)}{n+6}$
   B. $n = -3$ and $n = 6$
   C. *Sample explanation:* In part B, I found that the values of n for which the denominator equals zero are $n = -3$ and $n = -6$. Since neither of those values is a whole number, the accountant is correct.

Unit 3: Linear Equations

Lesson 1 *Linear Equations, Part 1* pp. 64–66

1. D [A1.1.2.1.1]
2. B [A1.1.2.1.1]
3. C [A1.1.2.1.1]
4. C [A1.1.2.1.1]
5. D [A1.1.2.1.2]
6. D [A1.1.2.1.1]
7. D [A1.1.2.1.1]
8. A [A1.1.2.1.2]
9. B [A1.1.2.1.2]
10. B [A1.1.2.1.1]
11. C [A1.1.2.1.2]
12. C [A1.1.2.1.2]

Lesson 2 *Linear Equations, Part 2* pp. 69–70

1. D [A1.1.2.1.1]
2. B [A1.1.2.1.1]
3. A [A1.1.2.1.1]
4. A [A1.1.2.1.3]
5. D [A1.1.2.1.1]
6. D [A1.1.2.1.3]
7. C [A1.1.2.1.1]
8. B [A1.1.2.1.1]
9. D [A1.1.2.1.1]
10. D [A1.1.2.1.3]

Lesson 3 *Systems of Linear Equations* pp. 76–79

1. B [A1.1.2.2.1]
2. B [A1.1.2.2.1]
3. D [A1.1.2.2.1]
4. C [A1.1.2.2.2]
5. A [A1.1.2.2.1]
6. C [A1.1.2.2.1]
7. C [A1.1.2.2.2]
8. B [A1.1.2.2.1]
9. A [A1.1.2.2.1]
10. A [A1.1.2.2.2]
11. D [A1.1.2.2.1]
12. B [A1.1.2.2.1]

Unit 3 *Constructed-Response Review* pp. 80–88

1. [A1.1.2.1.1, A1.1.2.2.1]
   A. 20 weeks
   B. 10 weeks
   C. 11,000 miles
   Sample work:

$m = 100w + 10{,}000$	$m = 400w + 7{,}000$
$m = 100(10) + 10{,}000$	$m = 400(10) + 7{,}000$
$m = 1{,}000 + 10{,}000$	$m = 4{,}000 + 7{,}000$
$m = 11{,}000$	$m = 11{,}000$

2. [A1.1.2.1.1, A1.1.2.2.1]
   A. $x + y = 7$
   B. $6x + 10y = 60$
   C. 4.5 hours
   Sample work:
   $x + y = 7$
   $y = 7 - x$

   $6x + 10y = 60$
   $6x + 10(7 - x) = 60$
   $6x + 70 - 10x = 60$
   $-4x + 70 = 60$
   $-4x = -10$
   $4x \div (-4) = -10 \div (-4)$
   $x = 2.5$

   $6(2.5) + 10y = 60$
   $15 + 10y = 60$
   $10y = 60 - 15$
   $10y = 45$
   $y = 4.5$
   Alternative sample explanation: First I wrote an equivalent equation for the first equation in terms of y. I substituted the expression $7 - x$ for y in the second equation. I evaluated the second equation to find the value of x. Once I had the value of x, 2.5, I could substitute it for x in the second equation and solve for y, the number of hours Padma rented the kayak.
3. [A1.1.2.1.1, A1.1.2.1.3]
   A. $y = 2.4(x - 1) + 5.0$
   B. *Sample explanation:* The variable x represents the lizard's age in years, and the variable y represents the lizard's length in centimeters.
   C. $y = 2.4(12 - 1) + 5.0 = 2.4(11) + 5.0 = 26.4 + 5.0 = 31.4$ centimeters
4. [A1.1.2.1.2, A1.1.2.2.1, A1.1.2.2.2]
   A. Multiplication Property of Equality
   B. $x = 4, y = 7$
   Sample work and explanation: I multiplied each side of the first equation by 3 and each side of the second equation by 2, as follows:
   $(3)(3x + 2y) = (26)(3)$
   $(-2)(5x + 3y) = (41)(-2)$
   This produces two equations with a $6y$ term and a $-6y$ term, so I added these equations to eliminate the y terms and solved for x, as follows:
   $9x + 6y = 78$
   $-10x - 6y = 82$
   $-x = -4 \rightarrow x = 4$
   Then I substituted $x = 4$ into $3x + 2y = 26$ and solved for y:
   $3(4) + 2y = 26$
   $12 + 2y = 26$
   $2y = 14$
   $y = 7$
   C. *Sample explanation:* The solution $x = 4$, $y = 7$ means that each small brick is 4 inches tall and each large brick is 7 inches tall.
5. [A1.1.2.2.1, A1.1.2.2.2]
   A. Voltroxx: $y = 50 + 30x$
   Inkwest: $y = 80 + 27x$
   B. (10, 350)
   Sample work:
   $80 + 27x = 50 + 30x$
   $80 - 3x = 50$
   $3x = -30$
   $x = 10$

   $y = 50 + 30(10)$
   $y = 350$
   C. *Sample explanation:* The cost of the printer and 10 ink cartridges will be the same, $350, for both brands of printers.

Unit 4: Linear Inequalities

Lesson 1 *Linear Inequalities* pp. 92–94

1. A [A1.1.3.1.2]
2. D [A1.1.3.1.2]
3. C [A1.1.3.1.3]
4. B [A1.1.3.1.2]
5. C [A1.1.3.1.2]
6. D [A1.1.3.1.3]
7. B [A1.1.3.1.2]
8. B [A1.1.3.1.3]
9. D [A1.1.3.1.2]
10. A [A1.1.3.1.3]

Lesson 2 *Compound Inequalities* pp. 97–98

1. A [A1.1.3.1.1]
2. D [A1.1.3.1.1]
3. B [A1.1.3.1.1]
4. C [A1.1.3.1.1]
5. D [A1.1.3.1.1]
6. B [A1.1.3.1.1]