EOCT Review Questions Name: _____

Unit 1: Relationships Between Quantities

Example:

Convert 5 miles to feet.

Example:

Convert 45 miles per hour to feet per minute.

Example:

When Justin goes to work, he drives at an average speed of 65 miles per hour. It takes about 1 hour and 30 minutes for Justin to arrive at work. His car travels about 25 miles per gallon of gas. If gas costs $3.65 per gallon, how much money does Justin spend on gas to travel to work?

REVIEW EXAMPLES

1) The formula for density d is $d = \frac{m}{v}$, where m is mass and v is volume. If mass is measured in kilograms and volume is measured in cubic meters, what is the unit for density?

2) A rectangle has a length of 2 meters and a width of 40 centimeters. What is the perimeter of the rectangle?

EOCT Practice Items

1) A rectangle has a length of 12 m and a width of 400 cm. What is the perimeter of the rectangle?

A. 824 cm
B. 1600 cm
C. 2000 cm
D. 3200 cm

2) The tension caused by a wave moving along a string is found using the formula $T = \frac{mv^2}{L}$. If m is the mass of the string in grams, L is the length of the string in centimeters, and v is the velocity of the wave in centimeters per second, what is the unit of the tension of the string, T?

A. gram-centimeters per second squared

B. centimeters per second squared

C. grams per centimeter-second squared

D. centimeters squared per second

REVIEW EXAMPLES

1) An amount of $1,000 is deposited into a bank account that pays 4% annual interest. If there are no other withdrawals or deposits, what will be the balance of the account after 3 years?

2) The number of calories burned during exercise depends on the activity. The formulas for two activities are given.

$$C_1 = 0.012mt \text{ and } C_2 = 0.032mt$$

   a. If one activity is cooking and the other is bicycling, identify the formula that represents each activity. Explain your answer.

   b. What value would you expect the coefficient to have if the activity were reading? Include units and explain your answer.

EOCT Practice Items

1) The distance a car travels can be found using the formula $d = rt$, where d is the distance, r is the rate of speed, and t is time. How many miles does the car travel, if it drives at a speed of 70 miles per hour for $\frac{1}{2}$ hour?

A. 35 miles
B. 70 miles
C. 105 miles
D. 140 miles

2) A certain population of bacteria has an average growth rate of 0.02 bacteria per hour. The formula for the growth of the bacteria's population is $A = P_0(2.71828)^{0.02t}$, where P_0 is the original population, and t is the time in hours.

If you begin with 200 bacteria, about how many bacteria will there be after 100 hours?

A. 7
B. 272
C. 1,478
D. 20,000

Example:

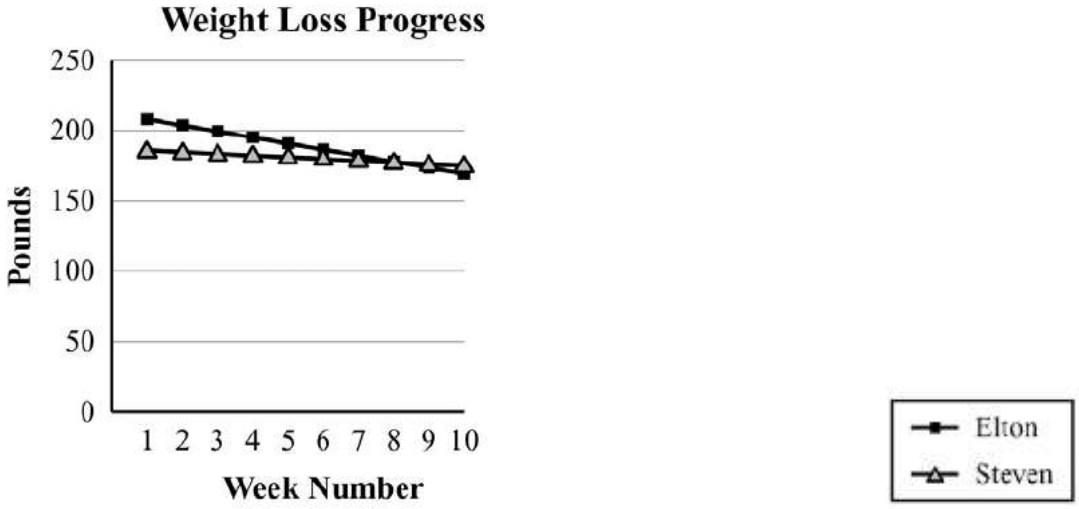
Two angles of a triangle measure 30° and 70°. What is the measure of the third angle?

Example:

A social media website currently has 1,000 members. The number of people that join the website triples every month. After how many months will the website have more than 1,000,000 members?

Example:

Elton loses 5 pounds each week. He started at 218 pounds on Week 1. Steven was 186 pounds on Week 1 and he loses 1 pound each week. The graph shows Elton's and Steven's weights by week.



a. What equations can be used to represent Elton's and Steven's weight loss?

b. After how many weeks do both Elton and Steven weigh the same number of pounds?

Example:

Mark has \$14 to buy lunch for himself and his sister. He wants to buy at least one sandwich and one drink. If sandwiches cost \$5 and drinks cost \$2, what combinations of numbers of sandwiches and drinks could Mark buy?

Example:

Solve the equation $m = \frac{y_2 - y_1}{x_2 - x_1}$ for y_2.

REVIEW EXAMPLES

1) The city of Arachna has a spider population that has been doubling every year. If there are about 100,000 spiders this year, how many will there be 4 years from now?

2) The Jones family has twice as many tomato plants as pepper plants. If there are 21 plants in their garden, how many plants are pepper plants?

3) The sum of the angle measures in a triangle is 180°. The angles of a certain triangle measure $x°$, $2x°$, and $6x°$. Solve for x.

4) A business invests $6,000 in equipment to produce a product. Each unit of the product costs $0.90 to produce and is sold for $1.50. How many units of the product must be sold in order for the business to make a profit?

EOCT Practice Items

1) The sum of the angle measures in a triangle is 180°. Two angles of a triangle measure 20° and 50°. What is the measure of the third angle?

A. 30°

B. 70°

C. 110°

D. 160°

2) Which equation shows $P = 2l + 2w$ when solved for w?

A. $w = \frac{2l}{P}$

B. $w = \frac{2l - P}{2}$

C. $w = 2l - \frac{P}{2}$

D. $w = \frac{P - 2l}{2}$

3) Bruce owns a business that produces widgets. He must bring in more in revenue than he pays out in costs in order to turn a profit.

- **It costs $10 in labor and materials to make each of his widgets.**
- **His rent each month for his factory is $4000.**
- **He sells each widget for $25.**

How many widgets does Bruce need to sell each month to make a profit?

A. 160

B. 260

C. 267

D. 400

Unit 2: Reasoning with Equations and Inequalities

Example:

Solve the equation $2y + 4 = 3(2x - 6)$ for y. Show and justify your steps.

Example:

Solve the equation $14 = ax + 6$ for x. Show and justify your steps.

Example:

Solve the inequality $4 - y > 5$ for y. Show and justify your steps.

REVIEW EXAMPLES

1) Are the algebraic expressions $4x - 2$ and $6x - 2(x - 1)$ equivalent?

3) Solve the equation $\frac{m}{6} + \frac{m}{4} = 1$ for m.

EOCT Practice Items

1) Which equation shows $ax - w = 3$ solved for w?

A. $w = ax - 3$
B. $w = ax + 3$
C. $w = 3 - ax$
D. $w = 3 + ax$

2) Which equation is equivalent to $\frac{7x}{4} - \frac{3x}{8} = 11$?

A. $17x = 88$
B. $11x = 88$
C. $4x = 44$
D. $2x = 44$

3) Which equation shows $4n = 2(t - 3)$ solved for t?

A. $t = \dfrac{4n - 2}{3}$

B. $t = \dfrac{4n + 2}{3}$

C. $t = 2n - 3$

D. $t = 2n + 3$

4) Which equation shows $6(x + 4) = 2(y + 5)$ solved for y?

A. $y = x + 3$

B. $y = x + 5$

C. $y = 3x + 7$

D. $y = 3x + 17$

Example:

Solve $2(3 - a) = 18$.

Example:

Solve $2(5 - x) > 8$ for x.

REVIEW EXAMPLES

1) Karla wants to save up for a prom dress. She figures she can save $9 each week from the money she earns babysitting. If she plans to spend less than $150 for the dress, how many weeks will it take her to save enough money to buy any dress in her price range?

2) Joachim wants to know if he can afford to add texting to his cell phone plan. He currently spends $21.49 per month for his cell phone plan, and the most he can spend for his cell phone is $30 per month. He could get unlimited texts added to his plan for an additional $10 each month. Or, he could get a "pay-as-you-go" plan that charges a flat rate of $0.15 per text message. He assumes that he will send an average of 5 text messages per day. Can Joachim afford to add a text message plan to his cell phone?

3) Two cars start at the same point and travel in opposite directions. The first car travels 15 miles per hour faster than the second car. In 4 hours, the cars are 300 miles apart. Use the formula below to determine the rate of the second car.

$$4(r + 15) + 4r = 300$$

What is the rate, r, of the second car?

EOCT Practice Items

1) This equation can be used to find h, the number of hours it takes Flo and Bryan to mow their lawn.

$$\frac{h}{3}+\frac{h}{6}=1$$

How many hours will it take them to mow their lawn?

A. 6
B. 3
C. 2
D. 1

2) A ferry boat carries passengers back and forth between two communities on the Peachville River.

- **It takes 30 minutes longer for the ferry to make the trip upstream than downstream.**
- **The ferry's average speed in still water is 15 miles per hour.**
- **The river's current is usually 5 miles per hour.**

This equation can be used to determine how many miles apart the two communities are.

$$\frac{m}{15-5}=\frac{m}{15+5}+0.5$$

What is m, the distance between the two communities?

A. 0.5 miles
B. 5 miles
C. 10 miles
D. 15 miles

3) For what values of x is the inequality $\frac{2}{3}+\frac{x}{3}>1$ true?

A. $x<1$
B. $x>1$
C. $x<5$
D. $x>5$

Example:

Solve this system of equations.

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

Example:

Solve this system of equations.

$$\begin{cases} 2x-y=1 \\ 5-3x=2y \end{cases}$$

Example:

Solve this system of equations.

$$\begin{cases} 2x-y=1 \\ 5-3x=-y \end{cases}$$

REVIEW EXAMPLES

1) Rebecca has five coins worth 65 cents in her pocket. If she only has quarters and nickels, how many quarters does she have? Use a system of equations to arrive at your answer and show all steps.

2) Peg and Larry purchased "no contract" cell phones. Peg's phone cost $25 plus $0.25 per minute. Larry's phone cost $35 plus $0.20 per minute. After how many minutes of use will Peg's phone cost more than Larry's phone?

3) Is (3, –1) a solution of this system?

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

4) Solve this system.

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

5) Solve this system.

$$\begin{cases} -3x-y=10 \\ 3x+y=-8 \end{cases}$$

EOCT Practice Items

1) A manager is comparing the cost of buying ball caps with the company emblem from two different companies.

- **Company X charges a $50 fee plus $7 per cap.**
- **Company Y charges a $30 fee plus $9 per cap.**

For what number of ball caps will the manager's cost be the same for both companies?

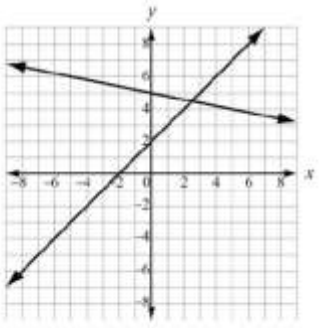
A. 10 caps
B. 20 caps
C. 40 caps
D. 100 caps

2) **A shop sells one-pound bags of peanuts for $2 and three-pound bags of peanuts for $5. If 9 bags are purchased for a total cost of $36, how many three-pound bags were purchased?**

A. 3
B. 6
C. 9
D. 18

3) **Which graph represents a system of linear equations that has multiple common coordinate pairs?**

A.



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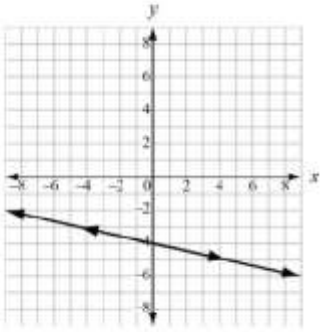

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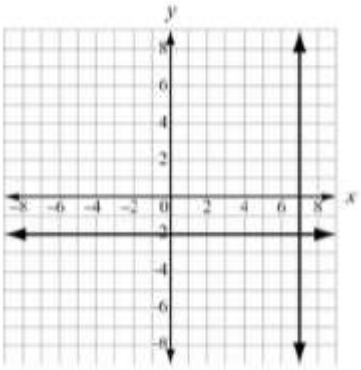

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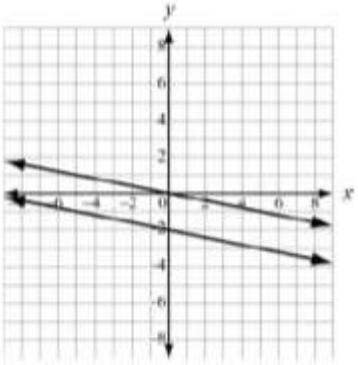


Example:

Use a number line to display the solution to $3x + 5 = 14$.

Example:

Use a number line to display the solution to $3x + 8 > 14$.

Example:

Use a number line to display the solution to $7 - 4x \geq 3$.

Example:

Use a rectangular coordinate system to display the solution to $3x + y = 14$.

Example:

Use a rectangular coordinate system to display the solution to $3x + y > -1$.

Example:

Graph the solutions of $y + 2 \leq x$.

Example:

Graph the solution of $y > x + 3$ and $y > -x + 1$.

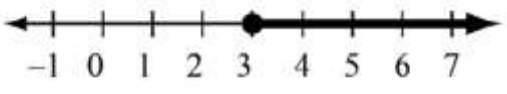
REVIEW EXAMPLE

1) Graph the solution region for $y \leq 2x - 1$.

EOCT Practice Items

1) Which graph represents $x > 3$?

A.



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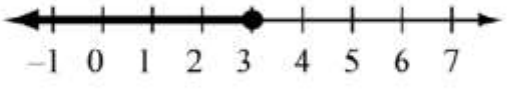

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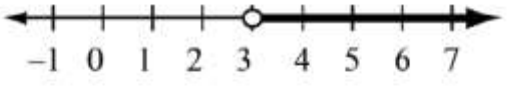
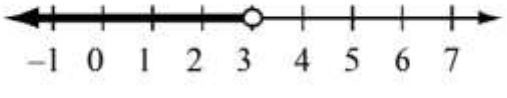
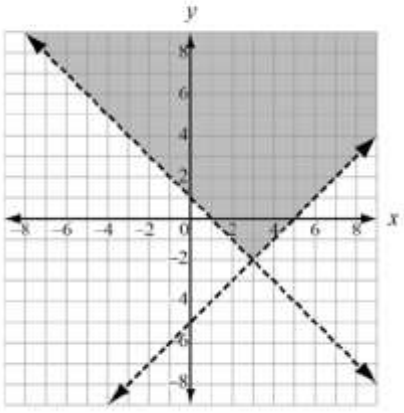


D.



2) Which pair of inequalities is shown in the graph?



A. $y > -x + 1$ and $y > x - 5$

B. $y > x + 1$ and $y > x - 5$

C. $y > -x + 1$ and $y > -x - 5$

D. $y > x + 1$ and $y > -x - 5$