

## warm up: Keystone packet #20

(20)

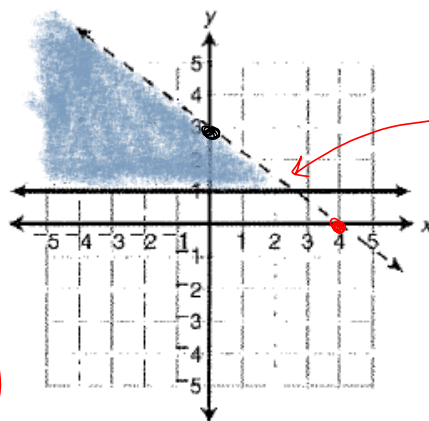
The solution set to a system of linear inequalities is graphed below.

$$-\frac{3}{4}x + 3 > y$$

↑  
m

↑  
y-int

$$y < -\frac{3}{4}x + 3$$
$$y \geq 1$$



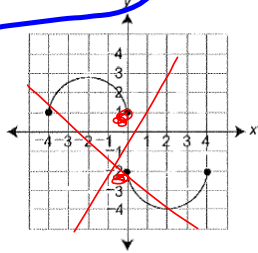
$$m = -\frac{3}{4}$$

Write a system of two linear inequalities that would have the solution set shown in the graph.

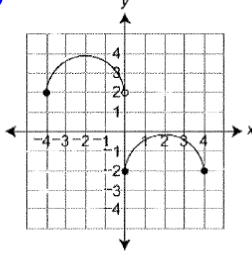
22

Which graph shows  $y$  as a function of  $x$ ?

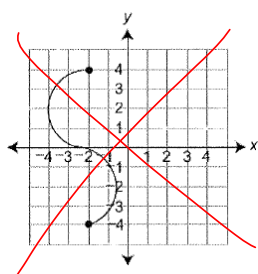
A.



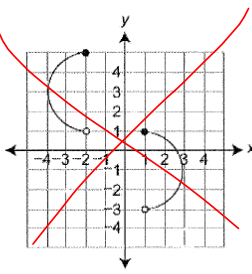
B.



C.



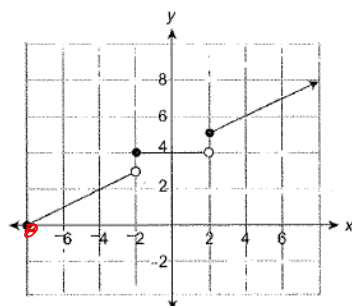
D.



functions  
must pass the  
vertical line test

The graph of a function is shown below.

23



Which value is not in the range of the function?

- A. 0
- B. 3
- C. 4
- D. 5

→ the y-values

The table below shows values of  $y$  as a function of  $x$ .

24

$x$	$y$
2	10
6	25
14	55
26	100
34	130

4 < 15  
8 < 30  
12 < 45  
8 < 30

Which linear equation describes the relationship between  $x$  and  $y$ ?

- A.  $y = 2.5x + 5$
- B.  $y = 3.75x + 2.5$
- C.  $y = 4x + 1$
- D.  $y = 5x$

$$\frac{\Delta y}{\Delta x} = \frac{15}{4} = \frac{30}{8} = \frac{45}{12} = 3.75$$

$$\begin{array}{l} 1) \sqrt{75} \\ 5\sqrt{3} \end{array}$$

$$\begin{array}{l} 3) \sqrt{36} \\ 6 \end{array}$$

$$\begin{array}{l} 5) \sqrt{80} \\ 4\sqrt{5} \end{array}$$

$$\begin{array}{l} 7) \sqrt{8} \\ 2\sqrt{2} \end{array}$$

$$\begin{array}{l} 2) \sqrt{16} \\ 4 \end{array}$$

$$\begin{array}{l} 4) \sqrt{64} \\ 8 \end{array}$$

$$\begin{array}{l} 6) \sqrt{30} \\ \sqrt{30} \end{array}$$

$$\begin{array}{l} 8) \sqrt{18} \\ 3\sqrt{2} \end{array}$$

$$9) \sqrt{32}$$
$$4\sqrt{2}$$

$$11) \sqrt{8}$$
$$2\sqrt{2}$$

$$13) \sqrt{125}$$
$$5\sqrt{5}$$

$$15) \sqrt{175}$$
$$5\sqrt{7}$$

$$10) \sqrt{12}$$
$$2\sqrt{3}$$

$$12) \sqrt{108}$$
$$6\sqrt{3}$$

$$14) \sqrt{50}$$
$$5\sqrt{2}$$

$$16) \sqrt{28}$$
$$2\sqrt{7}$$

$$17) \sqrt{45}$$
$$3\sqrt{5}$$

$$19) \sqrt{20} = \sqrt{4 \cdot 5}$$
$$2\sqrt{5}$$

$$18) \sqrt{72}$$
$$6\sqrt{2}$$

$$20) \sqrt{150}$$
$$5\sqrt{6}$$

PART 2: If there is a coefficient, multiply the whole numbers.

□

G.

$$3\sqrt{50}$$

$$3\sqrt{25 \cdot 2}$$

$$15\sqrt{2}$$

H.

$$8\sqrt{98}$$

I.

$$5\sqrt{27}$$

J.

$$3\sqrt{45}$$

□

Practice:

1.

$\sqrt{80}$

$4\sqrt{5}$

2.

$12\sqrt{90}$

$12\sqrt{9 \cdot 10}$

$36\sqrt{10}$

3.

$3\sqrt{125}$

$15\sqrt{5}$

4.

$2\sqrt{500}$

$20\sqrt{5}$

5.

$\sqrt{162}$

$9\sqrt{2}$

6.

$13\sqrt{625}$

$325$

$13\sqrt{25 \cdot 25}$

□



7.

$$9\sqrt{32}$$

8.

$$3\sqrt{52}$$

9.

$$4\sqrt{39}$$

10.

$$\sqrt{512}$$

11.

$$9\sqrt{72}$$

12.

$$2\sqrt{600}$$

13.

$$\sqrt{891}$$

14.

$$\sqrt{864}$$

15.

$$\sqrt{363}$$

Keystone Quiz #1

A

Name: \_\_\_\_\_

- 1) A compound inequality is shown below.

$$7 \leq 3 - 2x \leq 17$$

What is the solution of the compound inequality?

- a)  $2 \leq x \leq 7$   
 b)  $2 \geq x \geq 7$   
☒ c)  $-7 \leq x \leq -2$   
 d)  $-7 \geq x \geq -2$

$$\begin{array}{r} 7 \leq 3 - 2x \leq 17 \\ -3 \quad -3 \quad \quad 3 \\ \hline -4 \leq -2x \leq 14 \\ \frac{-4}{-2} \leq \frac{-2x}{-2} \leq \frac{14}{-2} \\ -2 \geq x \geq -7 \end{array}$$

$$\underline{-7 \leq x \leq -2}$$

- 2) Sara and her friends went to the movies. Sara bought  $x$  candy bars and  $y$  sodas. She spent a total of \$28. The equation below describes the relationship between the number of candy bars and the number of sodas purchased.

$$2x + 3y = 28$$

The ordered pair (5, 6) is a solution of the equation. What does the solution (5, 6) represent?

- ☒ a) Sara purchased 5 candy bars and 6 sodas.  
 b) Soda is 3 times as much as candy.  
 c) Candy is \$5 and soda is \$6.

Keystone Quiz #1

B

Name: \_\_\_\_\_

Version A



Version B



- 1) A compound inequality is shown below.

$$8 \leq 2 - 3x \leq 17$$

What is the solution of the compound inequality?

- a)  $2 \geq x \geq 5$   
 b)  $2 \leq x \leq 5$   
 c)  $-5 \geq x \geq -2$   
☒ d)  $-5 \leq x \leq -2$

$$\begin{array}{r} 8 \leq 2 - 3x \leq 17 \\ -2 \quad -2 \quad \quad -2 \\ \hline 6 \leq -3x \leq 15 \\ \frac{6}{-3} \leq \frac{-3x}{-3} \leq \frac{15}{-3} \\ -2 \geq x \geq -5 \end{array}$$

$$\underline{-5 \leq x \leq -2}$$

- 2) Sara and her friends went to the movies. Sara bought  $x$  candy bars and  $y$  sodas. She spent a total of \$28. The equation below describes the relationship between the number of candy bars and the number of sodas purchased.

$$5x + 6y = 28$$

The ordered pair (2, 3) is a solution of the equation. What does the solution (2, 3) represent?

- a) Soda is 3 times as much as candy bars.  
☒ b) Soda purchased 2 candy bars and 3 sodas.  
 c) Candy is \$2 and soda is \$3.  
 d) Sara spent \$2 on candy and 3 on soda.

1. What is the simplified form of the rational expression below?
- $$\frac{5x + 10}{10x}$$
- ~~$\frac{5(x+2)}{5 \cdot 2x}$~~
- $$\frac{\cancel{5}(x+2)}{\cancel{5} \cdot 2x} = \frac{x+2}{2x}$$
2. What is the simplified form of the rational expression below?
- $$\frac{6y}{4y^2 + 10y}$$
- ~~$\frac{2y \cdot 3}{2y(2y+5)}$~~
- $$\frac{\cancel{2y}^3}{\cancel{2y}(2y+5)} = \frac{3}{2y+5}$$

3. Simplify:

$$\frac{x^2 - 16}{x^2 + 5x + 4}$$

$$\begin{array}{c} 4 \quad 1 \\ \times \\ 4 \quad 5 \end{array}$$

$$= \frac{(x-4)(\cancel{x+4})}{(x+1)(\cancel{x+4})}$$

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

4. A rational expression is shown below.

$$\frac{x^2 - x - 2}{3x^2 + 8x + 5}$$

$$\begin{array}{c} -2 \quad 1 \\ \times \\ -2 \quad -1 \end{array}$$

The expression simplifies to  $\frac{x-2}{3x+5}$ .

What common factor of the numerator and denominator was removed?

$$\frac{(x-2)(\cancel{x+1})}{(3x+5)(\cancel{x+1})}$$

$$\begin{array}{l} m \quad x^2 + 8x + 15 \\ \vee \quad (x+5)(x+3) \\ D \quad \quad 3 \quad \quad 3 \\ \hookrightarrow (x+5)(x+3) \\ \hookrightarrow (3x+5)(x+1) \end{array}$$

$$\begin{array}{c} 15 \\ 5 \times 3 \\ 8 \end{array}$$

Keystone Exams: Algebra I

## MODULE 2—Linear Functions and Data Organizations

Standard A1.2.2

Ahava is traveling on a train.

The train is going at a constant speed of 80 miles per hour.

- A. How many hours will it take for the train to travel 1,120 miles?

$$y = 80h$$

$$\frac{1120}{80} = \frac{80h}{80}$$

$$14 = h$$

hours: 14

Ahava also considered taking an airplane. The airplane can travel the same 1,120 miles in 12 hours less time than it takes the train.

- B. What is the speed of the airplane in miles per hour (mph)?

$$\frac{1120}{2} = \frac{r(2)}{2}$$

$$\frac{14}{-12} = \frac{r}{2}$$

speed of the airplane: 560 mph

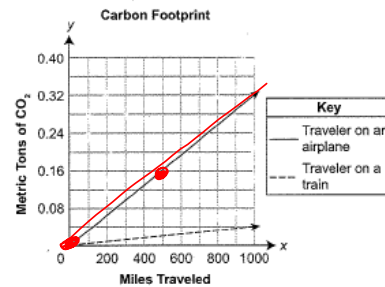
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Keystone Exams: Algebra I

## MODULE 2—Linear Functions and Data Organizations

Continued. Please refer to the previous page for task explanation.

Ahava is very concerned about the environment. The graph below displays the carbon dioxide ( $\text{CO}_2$ ), in metric tons, for each traveler on an airplane and each traveler on a train.



- C. What equation could be used to find the metric tons of  $\text{CO}_2$  produced ( $y$ ) by a traveler on an airplane for  $x$  miles traveled?

$$(500, .16) \quad (1000, .32)$$

$$\frac{.32 - .16}{1000 - 500} = \frac{.16}{500}$$

$$= .00032 \text{ or } \frac{1}{3125}$$

equation:  $y = .00032x$

## PART 3:

K. Given the expression:

$$3\sqrt{39x}$$

What value of  $x$  makes the expression equivalent to  $15\sqrt{39}$ ?

$$3\sqrt{39 \times 25}$$

Practice:

16. Given the expression:

$$\sqrt{89x}$$

What value of  $x$  makes the expression equivalent to  $18\sqrt{89}$ ?

$$\sqrt{89 \times 324}$$

$$18\sqrt{89}$$

$$x = 5.5$$

$$x = 25$$

$$x = 18 \cdot 18$$

$$x = 324$$

18. Given the expression:

$$4\sqrt{89x}$$

What value of  $x$  makes the expression equivalent to  $44\sqrt{89}$ ?

$$4\sqrt{89 \times 121}$$

$$x = 11 \cdot 11$$

$$x = 121$$

$$44\sqrt{89}$$

L.

$$\sqrt{77x}$$

For which value of  $x$  should the expression be further simplified?

a.  $x = 15$

b.  $x = 21$

c.  $x = 39$

d.  $x = 51$

$$\sqrt{77 \cdot 21}$$

$$\sqrt{7 \cdot 11 \cdot 3 \cdot 7}$$

17.

$$\sqrt{203x}$$

For which value of  $x$  should the expression be further simplified?

a.  $x = 82$

b.  $x = 287$

c.  $x = 53$

d.  $x = 2$

$$\sqrt{7 \cdot 29}$$

$$7 \cdot 41$$

19.

$$\sqrt{205x}$$

For which value of  $x$  should the expression be further simplified?

a.  $x = 38$

b.  $x = 65$

c.  $x = 122$

d.  $x = 13$



Practice:

16. Given the expression:

$$\sqrt{89x}$$

What value of  $x$  makes the expression equivalent to  $18\sqrt{89}$ ?

17.

$$\sqrt{203x}$$

For which value of  $x$  should the expression be further simplified?

a.  $x = 82$

b.  $x = 287$

c.  $x = 53$

d.  $x = 2$

18. Given the expression:

$$4\sqrt{89x}$$

What value of  $x$  makes the expression equivalent to  $44\sqrt{89}$ ?

19.

$$\sqrt{205x}$$

For which value of  $x$  should the expression be further simplified?

a.  $x = 38$

b.  $x = 65$

c.  $x = 122$

d.  $x = 13$

20. Given the expression:

$$8\sqrt{23x}$$

What value of  $x$  makes the expression equivalent to  $32\sqrt{23}$ ?

$$x = 16$$

21.

$$\sqrt{85x}$$

For which value of  $x$  should the expression be further simplified?

a.  $x = 59$

b.  $x = 185$

c.  $x = 2$

d.  $x = 74$

22. Given the expression:

$$5\sqrt{79x}$$

What value of  $x$  makes the expression equivalent to  $50\sqrt{79}$ ?

23.

$$\sqrt{215x}$$

For which value of  $x$  should the expression be further simplified?

a.  $x = 122$

b.  $x = 65$

c.  $x = 38$

d.  $x = 13$

HOMEWORK

Finish page 3 + 4 (radicals)

AND

KEY #27, 28, 29

- 
- KEY QUIZ #2 → FRIDAY, 4/16
  - RADICAL QUIZ → TUESDAY, 4/21

## FACTORING POLYNOMIALS

Directions: What numbers go in the blanks to make the equation true?

$$(2x^2 + \underline{\quad}x + 3)(\underline{\quad}x + 4) = \underline{\quad}x^3 + 20x^2 + 30x + 12$$

$$4x^3 + 30x^2 + 6x$$

$$8x^2 + 60x + 12$$