TURN IN
SKILL DRILLS

1.) What is the solution to the equation $-3\left(\frac{2}{3}x+6\right)=-26$?

$$-3\left(\frac{2}{3}x+6\right)=-26$$

$$-2x-18=-26$$

$$+18 \quad +18$$

$$\frac{-2x}{-2} = \frac{-8}{-2}$$

$$x = 4$$

2. How many solutions does the equation $-10x+35+5x=-5x+20$ have?

$-10x+35+5x=-5x+20$

$-5x+35=-5x+20$

$+5x \qquad +5x$

Only variables cancel out.

No solution

3. Solve the equation shown for x:

$2(x-4) = 4x + 3x + 6$

$2(x-4) = 4x+3x+6$

$2x-8 = 4x+3x+6$

$2x-8 = 7x+6$

$+8 \qquad +8$

$2x = 7x+14$

$-7x \qquad -7x$

$-5x = 14$

$\frac{-5x}{-5} = \frac{14}{-5} = -2.8$

4.)

The graph of a proportional relationship is shown.

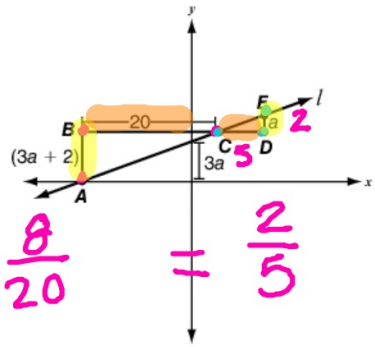
What is the unit rate?

unit rate per 1

$\frac{\$94}{2 \text{ weeks}}$

$\frac{\$47 \text{ dollars}}{\text{per week}}$

5.) Use the graph to answer the questions below.



Part A. If triangles *ABC* and *EDC* are similar and $CD = 5$, what is the slope of line *l*? Show your work.

similar
same shape
but different
sizes

$\frac{8}{20} = \frac{2}{5}$

Slope = $\frac{\text{Rise}}{\text{Run}}$

$\frac{3(2)+2}{20} = \frac{8}{20}$

$\frac{3a+2}{a} = \frac{20}{5}$

$20a = 5(3a+2)$

$20a = 15a + 10$

$-15a \quad -15a$

$5a = 10$

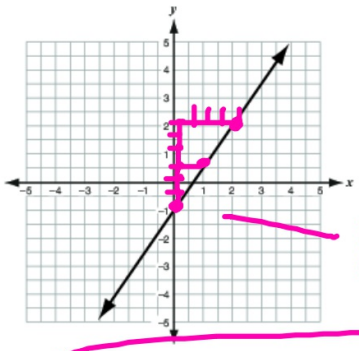
$a = \frac{10}{5}$

$a = 2$

6. What is the equation, in slope-intercept form, of the line plotted on the graph below?

$y = mx + b$

slope y-int



Slope

$\frac{\text{Rise}}{\text{Run}} = \frac{3}{2}$

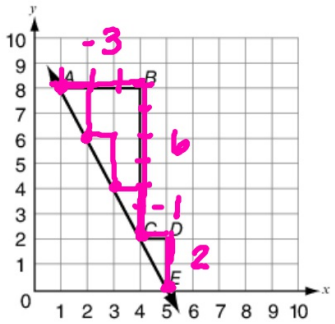
$y = \frac{3}{2}x - 1$

7. Use the graph to answer the questions below.

Slope

$\frac{\text{Rise}}{\text{Run}}$

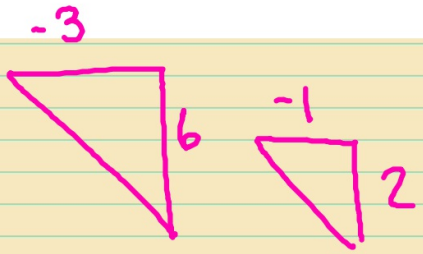
$\frac{2}{-1} = \frac{6}{-3}$



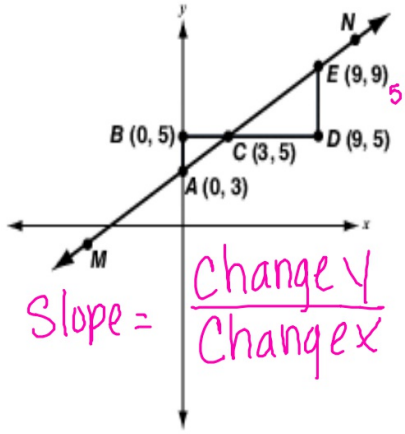
Part A. Explain how the triangle *ABC* and triangle *CDE* relate to each other.

Part B. What is the slope of the line given in the graph? Explain how each triangle's side lengths relate to the slope of the line.

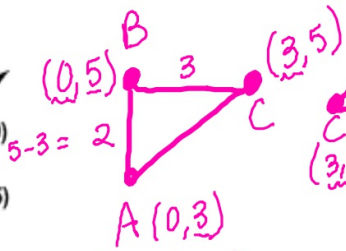
$-\frac{6}{3} = \frac{2}{-1}$



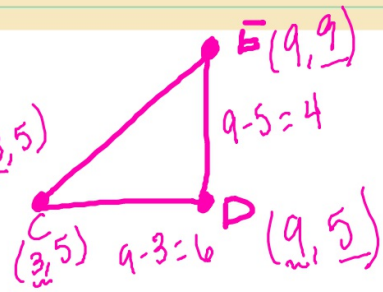
8. Look at the graph below.



Slope = $\frac{\text{Change } y}{\text{Change } x}$



Slope = $\frac{2}{3}$



Slope = $\frac{4}{6}$

$\frac{2}{3} = \frac{4}{6}$

What is the ratio of the vertical side length to the horizontal side length of both the triangles, and how does it compare to the slope of the line.

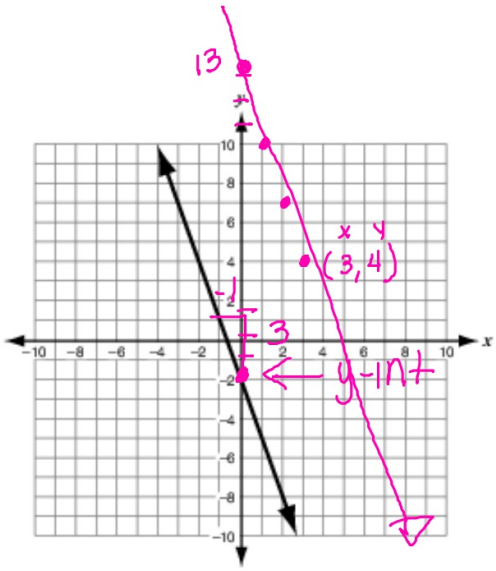
y x

9. Look at the graph.

$y = mx + b$

slope y-int

$y = -\frac{3}{1}x - 2$



Part A. Write an equation that models the linear relation in the graph. $y = -\frac{3}{1}x - 2$

Part B. Write an equation for a line with the same slope that passes through the point (3, 4).

Use words, numbers, and/or pictures to show your work. $y = -\frac{3}{1}x + 13$

11. Does the equation below represent a linear relationship?

$$2x - 5y = -15$$

Justify your response.

$y = mx + b$

$2x - 5y = -15$

$\frac{-5y}{-5} = \frac{-2x}{-5} - \frac{15}{-5}$

$y = \frac{2}{5}x + 3$

Slope: $\frac{2}{5}$ y-int: 3

12. What values of x and y satisfy the system of equations shown below?

solution (x, y)

$$\begin{cases} 3x - 2y = 7 \\ 9x - 6y = 21 \end{cases}$$

$-3(3x - 2y = 7)$

$-9x + 6y = -21$

$+ \quad 9x - 6y = 21$

$3x - 2y = 7$

$\frac{-2y}{-2} = \frac{-3x}{-2} + \frac{7}{-2}$

$y = \frac{3}{2}x - \frac{7}{2}$ ✓

$9x - 6y = 21$

$\frac{-6y}{-6} = \frac{-9x}{-6} + \frac{21}{-6}$

$y = \frac{9}{6}x - \frac{21}{6}$ ✓

many solutions

1 line on a graph

13. What is the ordered pair that represents the solution to the system of equations shown below?

$$\begin{cases} 2x + y = 7 \\ 10x - 6y = 46 \end{cases}$$

$(x=4, y=-1)$

Elimination

$-5(2x+y=7)$

$+\ 10x-6y=46$

$-10x-5y=-35$

$+\ 10x-6y=46$

$-11y=11$

$\frac{-11y}{-11}=\frac{11}{-11}$

$y=-1$

$y=-2x+7$

$10x-6(-2x+7)=46$

$10x+12x-42=46$

$22x-42=46$

$+42 \quad +42$

$\frac{22x}{22}=\frac{88}{22}$ $x=4$

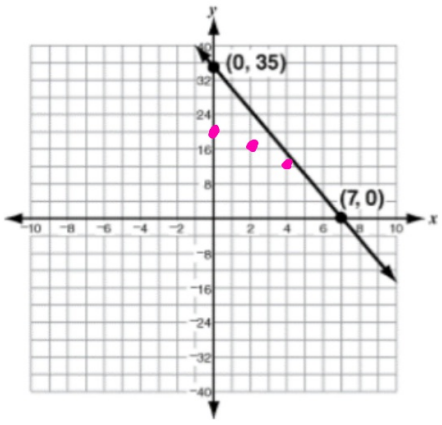
$y=-2(4)+7$

$-8+7$

$y=-1$

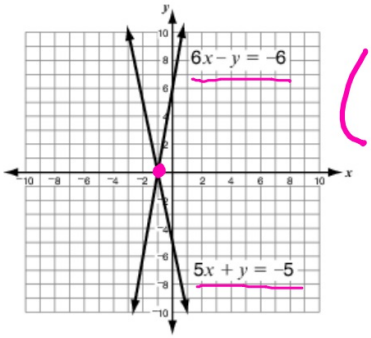
14. A system of equations contains the line shown in the graph below and a line with the equation $y=-2x+20$.

$\frac{-2}{1}=\frac{-4}{2}$



At what point do the graphs of these equations intersect?

15. Part A. What is the solution to the system of equations shown on the coordinate grid below?



(-1,0)

Part B. How does the solution to the system of equations $2x + y = 3$ and $4x + 2y = 4$ compare with that of the system of equations graphed on the coordinate grid above?

Parallel
No solution

$2x+y=3$

$y=-2x+3$

$4x+2y=4$

$\frac{2y}{2}=\frac{-4x}{2}+\frac{4}{2}$

$y=-\frac{2}{1}x+2$

18. What is the decimal expansion of the fraction $\frac{7}{9}$?

(Use long division)

$0.7\overline{7}$

$9\overline{)7.00}$

63

70

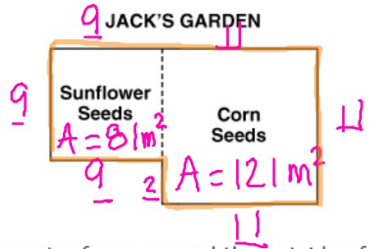
$0.77\ldots\ldots$

10. Select all numbers that are irrational.

- $\frac{1}{3}$
- $\sqrt{2}$
- π
- $\frac{2}{9}$
- $\sqrt{3}$

20. Jack divides his garden into ~~two square~~ plots of land in which he will plant sunflower seeds and corn seeds. He plants sunflower seeds in the smaller square part of the garden that covers an area of $81\ m^2$. He plants corn seeds in the larger square part of the garden that covers an area of $121\ m^2$. The diagram below shows the parts of the garden where Jack will plant each type of seed.

$A=\sqrt{81}$
side $=9$
$A=\sqrt{121\ m^2}$
side $=11$



If Jack decides to put a fence around the outside of the entire garden, what is the minimum amount, in meters, of fencing he will need?

Fence = perimeter = 62m

21. If $x^3 = 125$ and $y^3 = 8$, what is the value of $y - x$?

$\sqrt[3]{125}$ $\sqrt[3]{8}$

$x = 5$ $y = 2$

$y - x$

$2 - 5 = -3$

22. Mr. Rodriguez has a square garden with an area of 324 square feet. He wants to put a fence along 3 sides of the garden. What is the fewest number of feet of fencing he will need?

1 = 18ft

A = 324

2 = 18ft

3 = 18ft

$A = \sqrt{324}$

Side = 18

18 + 18 + 18 = 54ft of fence

23. What is the value of x in the equation $x^3 = \frac{27}{125}$?

$$x^3 = \frac{\sqrt[3]{27}}{\sqrt[3]{125}}$$

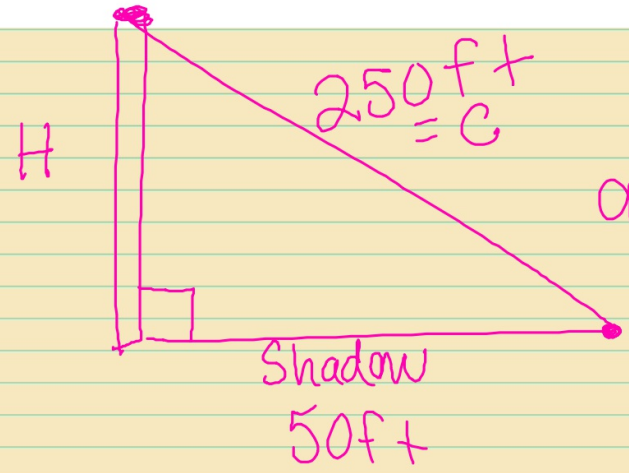
$$x = \frac{3}{5}$$

24. Write a rational number in fraction form that is equivalent to $-1.\overline{5}$.

$$-1.\overline{5}$$

$$-1\frac{5}{9} = -\frac{14}{9}$$

25. A building casts a shadow that is 50 feet in length. If the distance from the end of the shadow to the top of the building is 250 feet, what is the height of the building? Round your answer **to the nearest hundredth**.



$a^2+b^2=c^2$

$a^2+50^2=250^2$

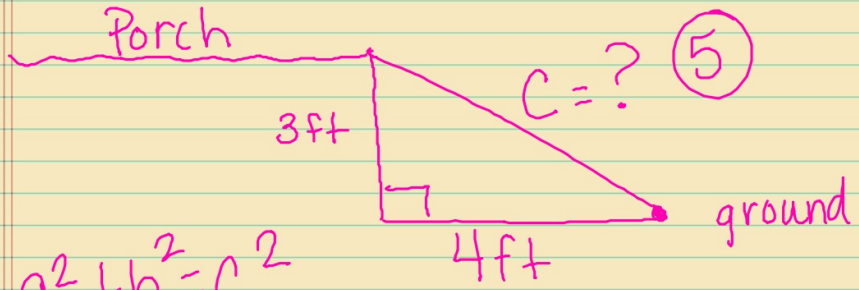
$a^2+2500=62{,}500$

-2500

$a^2=\sqrt{60{,}000}$

$a=244.95$

27. Albie wants to build a ramp from his porch to a point on the ground 4 feet away from the base of the porch. What is the length, in feet, of the ramp if the porch has a height of 3 feet?



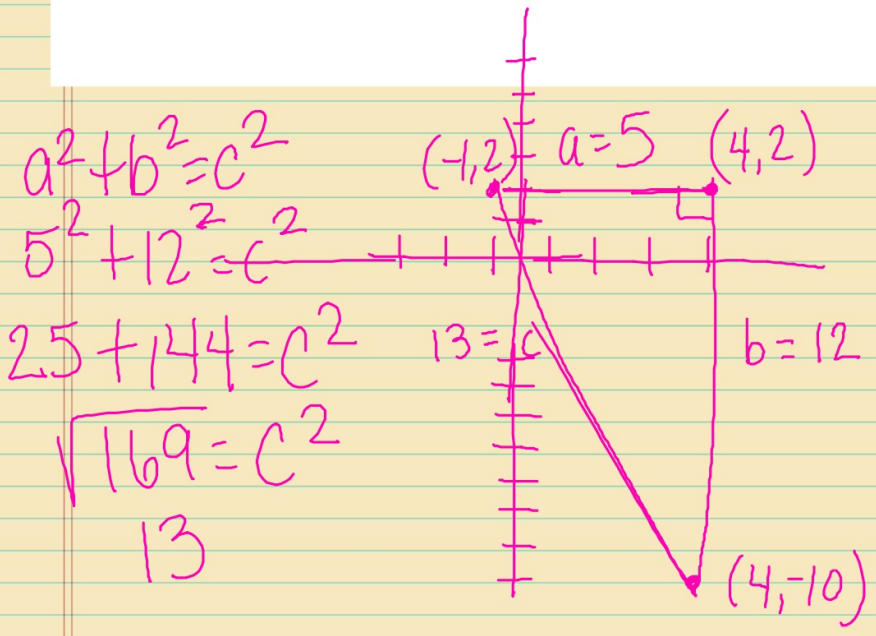
$a^2+b^2=c^2$

$3^2+4^2=c^2$

$9+16=c^2$

$\sqrt{25}=c^2$

28. The vertices of a triangle are located at $(-1, 2)$, $(4, 2)$, and $(4, -10)$ on a coordinate grid. What is the perimeter of the triangle in units?



$a^2+b^2=c^2$

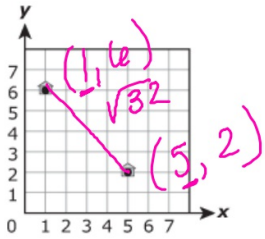
$5^2+12^2=c^2$

$25+144=c^2$

$\sqrt{169}=c^2$

13

30. The coordinate grid below shows the location of two friends' houses.



What is the shortest distance, in units, between the houses?

$$\sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$$

$(5-1)^2+(2-6)^2$

$(4)^2+(-4)^2$

$16+16=\sqrt{32}$