

Accelerated Study Guide

3rd Nine Weeks

Probability and Linear Functions

1. Nate places nine cards that are labeled 1 to 9 face down on the table and mixes them up. What is the likelihood that his friend Penny will draw an even numbered card?

A impossible



unlikely

C as likely as not D certain

There are four even numbers, so probability is $\frac{4}{9}$.
Less than half, so it is unlikely.

2. On the last math test in Gin's class, 13 out of 25 students scored a 70 or higher. Which **percent** is closest to the experimental probability that a student selected at random will score a 70 or higher on the next test?

- 52%

$$13/25 = 0.52 = 52\%$$

3. Tracey's sandwich shop offers a lunch special on sandwiches on white, oatmeal, rye, 7-grain and whole wheat breads. You can also choose between roast beef, roasted vegetables, tuna salad, and chicken. How **many different sandwiches** can you make for the lunch special?

- 20

Counting Principle:

There are 5 choices of bread and 4 choices of filling. So, $5(4) = 20$

4. A bag contains 9 blue marbles and 1 green marble. What is the probability of drawing a blue marble followed by a green marble, **without** replacing the first marble before drawing the second marble?

- 1/10

Probability of getting a blue 9/10

Probability of getting a green after taking a blue out 1/9

$$9/10(1/9) = 9/90 = 1/10$$

5. Christy rolls a number cube and then chooses a card from a set numbered 1 through 9. What is the probability that she will roll an even number *and* choose an odd card?

- 5/18

Probability of getting an even number on
number cube $3/6$

Probability of getting an odd from cards $5/9$

So, $3/6(5/9) = 15/54 = 5/18$

6. Rachael packs 2 tubes of paint into a gift box. She has 6 colors of paint to choose from: red, blue, yellow, and green, black, and white. How many **combinations** of two different paints can she pack into the box?

• 15

Use combination

$$\frac{6!}{(6-2)!2!}$$
$$\frac{6 \bullet 5 \bullet \cancel{4} \bullet \cancel{3} \bullet \cancel{2} \bullet \cancel{1}}{(\cancel{4} \bullet \cancel{3} \bullet \cancel{2} \bullet \cancel{1})(2 \bullet 1)}$$
$$\frac{30}{2} = 15$$

7. In how many **different ways(order)** can 7 people stand in line for movie tickets?

- 5040

Permutation P!

$$7! = 7 \bullet 6 \bullet 5 \bullet 4 \bullet 3 \bullet 2 \bullet 1 = 5040$$

8. Mario rolls two number cubes. What is the probability that the sum of the two numbers will be 3?

- $1/36$

You will need a 1 and a 2.

Probability of getting a 1 is $1/6$

Probability of getting a 2 is $1/6$

So, $1/6 \bullet 1/6 = 1/36$

9. Michael makes 7 out of 10 free throws. What is the probability that he will **not** make the next shot?

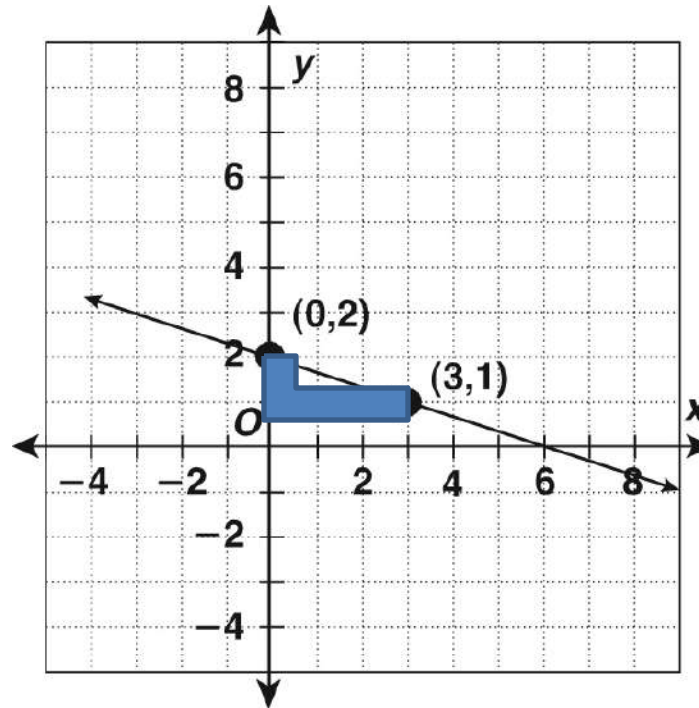
- 2/5

Probability is 7/10, so probability of not making a free throw is $\frac{7-3}{10} = \frac{4}{10} = \frac{2}{5}$

10. What is the slope of the line in the figure below?

1. Locate two points on the graph.
2. Draw a right angle to connect the points.
3. Count the rise (up/down)
4. Count the run (left/right)
5. Slope is $\frac{\text{rise}}{\text{run}}$
6. Decide if it is positive or negative.

-1/3



11. What is the slope of the line that passes through the two points (3, -5) and (-1, 6)?

- Use finding slope from 2 points.

$$\frac{y_2 - y_1}{x_2 - x_1}$$

$$x_2 - x_1$$

Label the points $(3_{x1}, -5_{y1})$ $(-1_{x2}, 6_{y2})$

Plug them into the

formula

$$\frac{6 - (-5)}{-1 - 3} = \frac{11}{-4}$$

$$m = -11/4$$

12. Identify the x - and y -intercepts for the line
 $6x + 4y = -12$

Plug zero in for the x and solve.

$$6(0) + 4y = -12$$

$$4y = -12$$

$$y = -3$$

y -intercept $(0, -3)$

Plug zero in for y and solve.

$$6x + 4(0) = -12$$

$$6x = -12$$

$$x = -2$$

x -intercept $(-2, 0)$

13. Express the equation $3x - 4y = 8$ in slope-intercept form

- Slope-intercept form is $y = mx + b$
- So you need to solve for y

Subtract $3x$ from both sides.

$$\cancel{3x} - 4y = 8$$

$$\cancel{-3x} \quad \underline{-3x}$$

Bring down what is left on each side

$$\underline{-4y} = \underline{-3x + 8}$$

Divide by -4 on both sides

$$\underline{-4} \quad \underline{-4}$$

Answer

$$y = \frac{3}{4}x - 2$$

14. Write the equation that has a slope of -2 and passes through the point $(0, 3)$.

- The slope and y-intercept are given.

- Plug them into $y = mx + b$


$$y = -2x + 3$$

15. The data set below represents a direct variation.
Identify the constant of proportionality.

X	1	2	3	4	5	6	7
y	$\frac{9}{2}$	9	$\frac{27}{2}$	18	$\frac{45}{2}$	27	$\frac{63}{2}$

To find the constant, solve for k. $Y = kx$ is the direct variation formula.

So use $k = y/x$

Plug in some of the easier numbers	$\frac{9/2}{1}$	$\frac{9}{2}$	$\frac{18}{4}$	$\frac{27}{6}$
Reduce	$9/2$	$9/2$	$9/2$	$9/2$

Answer

$$k = 9/2$$

16. Find the equation of direct variation, given that y varies directly with x , and x is 24 when y is 60.

- Direct Variation Equation is $y = kx$
- Plug in the given numbers $\frac{60}{24} = \frac{k(24)}{24}$
- Solve for k by dividing 24 on both sides. $2.5 = k$
- Answer

17. What is the slope of the line with the equation $y + 4 = 5 - x$?

- You must put the equation into slope-intercept form first. $Y = mx + b$

So, solve for y .

Subtract 4 on both sides.

Bring everything left down

Put in $y = mx + b$ form

$$y + 4 = 5 - x$$

$$\begin{array}{r} -4 \\ \hline \end{array} \quad \begin{array}{r} -4 \\ \hline \end{array}$$

$$y = 1 - x$$

$$y = -x + 1$$

18. Which relation below is *not* a function?

A $y = 5$

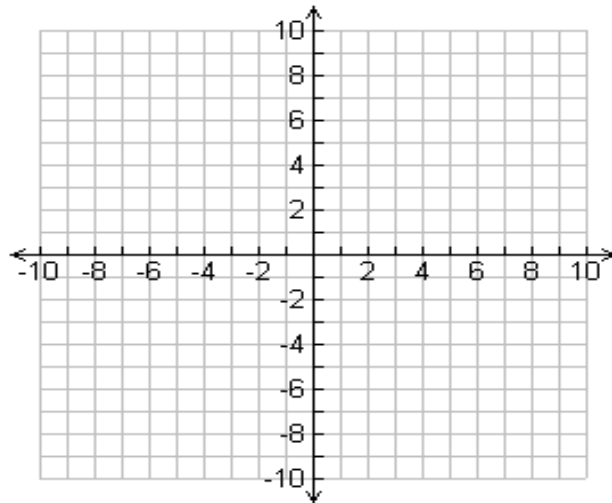
C $x = 3$

B $y = 2x^2$

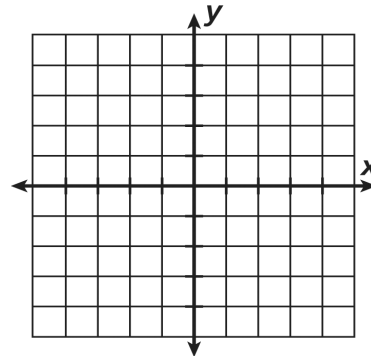
D $y = 6x$

19. For the function $y = -x + 6$, find the value of y if $x = -3$.

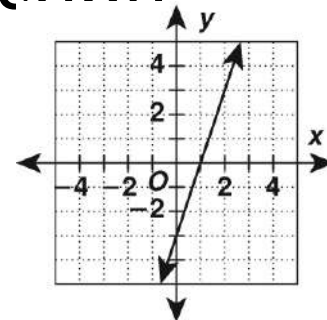
- Find the slope of the line that passes through $(2, 5)$ and $(2, -4)$.
- Find the equation of a line that has an x -intercept of -2 and a y -intercept of 4 .



- What is the y -intercept of the graph with equation $2x - 3y = 12$?
- Find the equation of the line with slope -1 passing through $(3, 1)$.
- Graph the equation of the line with slope 0 passing through $(4, 3)$.

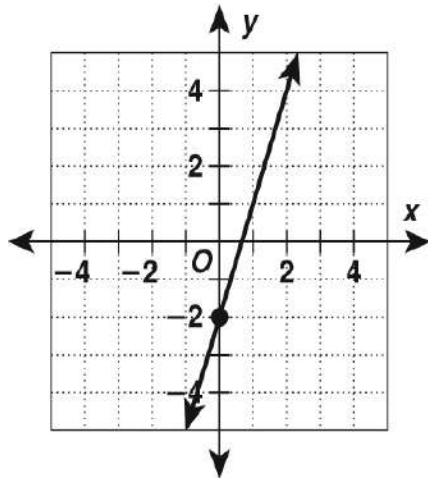


- Does the data in the table show a direct variation? Explain $k = y/x$ they are all $3/2$
- Find the equation of direct variation, given that y varies with x . y is 24 when x is 8
- Identify the equation for the function represented in the graph below
- $y = 1/3x - 3$



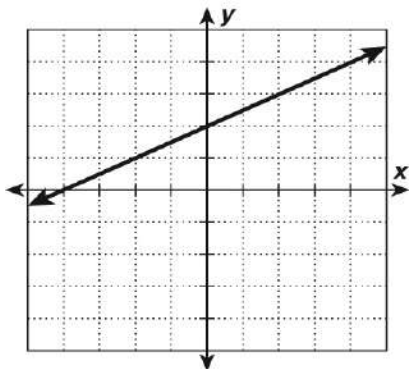
- Which of these functions is a linear function?
 - G $y = -2x$

Identify the rule for the linear function



- A copy center charges \$1.50 for the first color copy and \$0.50 for each additional copy. Record a rule that gives the cost for x color copies?

- Write a linear function that passes through the points $(1,3)$ and $(4,-3)$. (3 step process



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

Which table displays points that will lie on the graphed line?

FORMULAS

- $Y = mx + b$
- $Y = kx \quad k = y/x$
- $M = y - y/x - x$