

1. What is the definition of a function?
When there is only 1 output for every input.

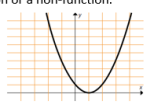
2. What can help you determine a function from a non-function graphically?
The Vertical Line test

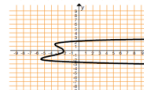
3. How can your graphical method for identifying functions when the data is provided in a table?
Each x-value in the table has only one y-value

4. What distinguishes a function from a non-function in a/an:
 a. Table? *← see # 3*
 b. Graph? *← see # 2*
 c. Equation?
 d. Map? *Each input value matches with only 1 output value*

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5. State whether the representation is of a function or a non-function.

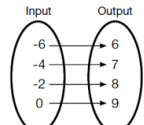
a.  *Fun.*

b.  *Non-Fun.*

c.

x	y
-7	13
0	10
9	21
-7	-6

Non-Fun.

d.  *Fun.*

e. $y^2 = 2x - 4$ *Non-Fun.*

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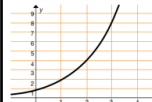
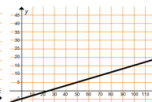
6. How is the structure of a linear function different from that of a non-linear function?
The rate of change is "constant" You increase (+ or -) by the same amount each time.

7. How can you see a linear pattern in a table?
*The rate of x to y is changing the same.
 ~ As x increases amount, y increases amount is the same ratio from point to point.*

8. How does the graph of a line compare to a linear table?
Slope = rate of change

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Use the following Graphs to help you answer questions 8 & 9.

9. Why is the exponential graph not linear?
You aren't increasing by the same amount each time.

10. How does the rate of change compare to that of the linear function?
Slope = rate of change ~ How is x changing in relation to how y is changing.

11. How many times can a linear function intersect the x-axis? Is this true for all functions?
Once ← true for all linear functions, False of all functions in general

12. How many times can a linear function intersect the y-axis? Is this true for all functions?
** Same as 11.*

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13. Frank's electric company charges \$0.15 per Kilowatt hour plus a basic connection charge of \$20 per month.

a. Write an equation representing the situation. $y = 0.15x + 20$

b. Identify the slope and explain what that value represents slope. *0.15 ← total changes based on # of hrs.*

c. Identify the y-intercept and explain why that value represents the constant.
20 ← even if no kilowatts are used, you will still pay the \$20 fee.

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14. What is the difference between a dependent and independent variable?
independent (x) You control dependent (y) is a result of the independent

15. Identify the independent and dependent variable in each given situation.

a. The number of homework assignments you haven't turned in and your grade in the class.
I = HW D = Grade

b. The temperature of a carton of milk and the length of time it has been out of the refrigerator.
I = time D = temp.

c. The number of times you dip a wick into hot wax and the diameter of a hand-made candle.
I = # of times D = diameter

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16. The Smith family is traveling from their home in Nashville, TN to Orlando, FL for Christmas. The trip is 685 miles and they will be traveling 65 miles per hour, on average. The trip can be modeled by the function $D = 685 - 65h$.
- What is the slope of the equation and what does it mean in context of the problem?
 $-65 \leftarrow$ each hour they have traveled 65 miles.
 - What are the intercepts and what do they mean in context of the problem?
 $Y = 685 \leftarrow$ How many miles are left.
 - What is the independent and dependent variable? How do you know?
 $X = 10.54 \leftarrow$ how long it took them to get there.

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17. To clean out her new 120-gallon fish tank, Julie purchased a water pump that will siphon out three gallons of water every minute.
- $$G = 120 - 3m$$
- Identify the slope and explain what that value represents slope.
 $m = -3 \leftarrow$ every minute you lose 3 gal of water
 - Identify the variables and determine which is the independent and dependent.
 $m = \text{time} \leftarrow$ independent
 $G = \# \text{ gal.} \leftarrow$ dependent

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18. What is the formula/equation of a line in point-slope form?
 $y - y_1 = m(x - x_1)$
19. What is the formula/equation of a line in slope-intercept form?
 $y = mx + b$
20. Write an equation of the line in slope-intercept form that passes through the following points.
- $(-2, -1)$ and $(5, 13)$
 - $(-1, 5)$ and $(3, 1)$
 - $(0, -3)$ and $(5, -5)$
- \star See 4.6 Notes!

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Write an equation for each given situation. Then determine the slope, y-intercept, and x-intercept AND explain their real-world meanings.

21. At the beginning of October, Sarah changed banks and decided to leave the remaining \$3900 in her old account to pay for rent. After 6 months, her balance was finally at \$0. If the balance, B , in Sarah's account is a function of time, t , write an equation for the situation.
- $$B = 3900 - 600t$$
- Slope: $-600 \leftarrow$ amount of decrease each time
 Y-int: $3900 \leftarrow$ how much \$ she started with
 X-int: $6.5 \leftarrow$ how long it took to empty the account
22. On a recent scuba diving trip, Kate and James reached a depth of 130 ft. Six-and-a-half minutes later after ascending at a constant rate, they reached the surface. Write an equation to represent their distance, D , as a function of time, t .
- $$D = -130 + 20t$$
- Slope: $20 \leftarrow$ distance traveled every minute
 Y-int: $-130 \leftarrow$ depth of water
 X-int: $6.5 \leftarrow$ how long it took to reach the surface.

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23.

- Write an equation to represent each graph.
 $y = -4x + 4$
 $y = x + 4$
 $y = -\frac{4}{3}x + 4$
 $y = 4x + 2$
- Which 2 graphs would represent liquid being emptied from one container and filling another?
 $G2$ & $G6$
- How do you know?
 \leftarrow They have opp. slopes, meaning that one is decreasing at the same rate the other is increasing.

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