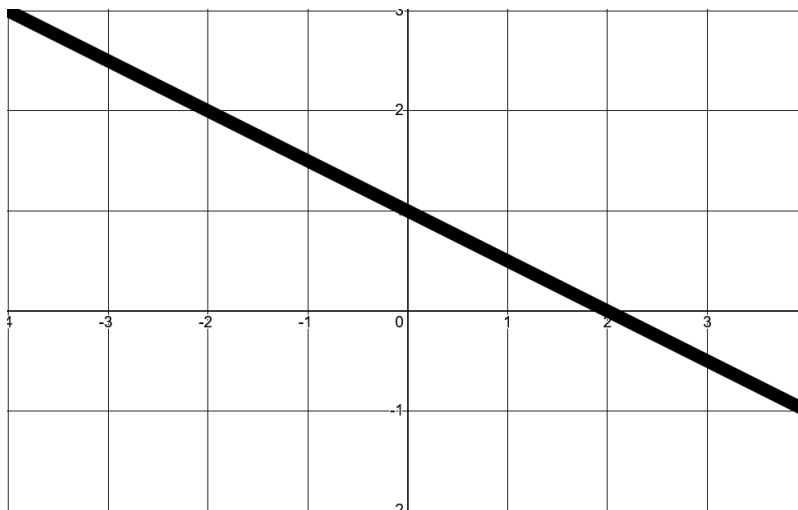


MTH 161: Carney

Study Guide Test 2

Name: _____

1. Given the linear function $f(x) = 2(x - 3) + 12(x + 1)$, find the slope and the y -intercept.
2. Given the following image of a linear function, identify the function.



3. Given the functions on the left and the right, draw a line between two functions if they are parallel. Also draw a line between two functions if they are perpendicular. Each function will connect to exactly one on the other side.

$$3x + 1$$

$$\frac{1}{2}x - 2$$

$$\frac{1}{3}x + \frac{1}{3}$$

$$2x$$

$$-(2x + 1)$$

$$\frac{1}{3}(2 - 9x)$$

$$-2(1 - x)$$

$$3(x + 2)$$

4. Find an equation for the line going through the points $(1, 3)$ and $(4, 5)$.
5. Graph the function $g(x) = \frac{1}{3}x - 4$.

6. Find the point where the lines $y = 3x - 2$ and $y = -x + 8$ intersect.
7. One hiker is hiking up a trail at a speed of 10 vertical feet per minute, starting at 200 feet. Another hiker is traveling down from the 3,000 foot peak at a speed of 15 vertical feet per minute. If they start at the same time, when do they meet each other on the trail?
8. The water bill for your new apartment is calculated as such: a base charge of \$15 is applied to your bill. Then, for each additional gallon you use, you are charged \$0.01. If your bill is \$23.07, how many gallons did you use? How much would you be charged if you used 1500 gallons?
9. Write a polynomial with degree 2, leading coefficient -3 , and zeroes 1 and 4.
10. Graph the following polynomial: $h(x) = (x + 1)^3(x - 2)^2(x - 4)$.
11. Describe the end behavior of the function $j(x) = x^3 + 2x^2 - 8x^4 + 15$.
12. Put the quadratic $2x^2 - 3x + 2$ into vertex form.
13. Put the quadratic $7x^2 - 3x + 1$ into vertex form.
14. Put the quadratic $x^2 - 7x + 13$ into vertex form.
15. A basketball player throws a basketball into a hoop. The function that models the basketball's motion is $b(t) = -10t^2 + 9t + 3$, where b is measured in meters and t is measured in seconds. What is the highest point that the basketball reaches on its flight?
16. Using long division, simplify $(x^4 - 5x^2 - 5x + 2) \div (x^2 + 1)$.
17. Using synthetic division, simplify $(x^5 - 7x^4 + 5x^2 + 3x - 2) \div (x - 1)$.
18. Using either method, simplify $(x^7 - 128) \div (x - 2)$.
19. Given that the function $s(x) = x^3 + 6x^2 - 13x - 42$ has -2 as a root, fully factor $s(x)$.