

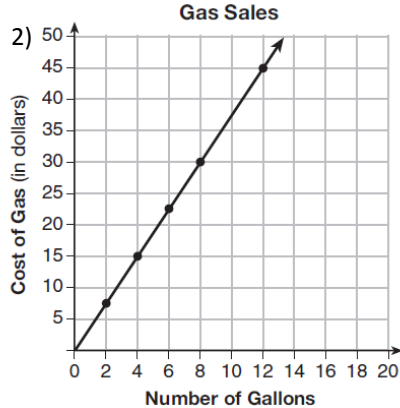
Algebra Review Problems

Answers and Problems also posted online at: mathisnohard.com/algebrareview2016/

1) A plumber charges a fixed rate for a house call and then adds in an hourly rate for each hour he works. He determines how much he charges customers using the formula:

$C(x) = 75 + 50x$. In this equation the 75 represents:

- 1) Charge per hour 2) Fixed rate 3) Number of hours 4) Total cost



Using this graph, what would be the proper function that is represented?

- 1) $f(x) = 3.75x$ 2) $f(x) = 4x + 15$
 2) $f(x) = x + 15$ 4) $f(x) = 3.75x + 15$

3) Joe invests \$1000 in a savings account for his daughter's college education. He uses the function $y = 1000(1.02)^{4x}$ to determine how much money in the account (x is the number of years the money has been in the account). How much money has the account gained between the end of the 1st and end of the 12th year?

- 1) \$1082.43 2) \$2587.07 3) \$1504.64 4) \$1268.24

4) Sarah takes out a loan from the bank and uses the equation $I = Prt$ to determine how much interest she will owe. To determine the amount of time the loan will be issued for she rearranges the equation so that it is solved for t . Which of the following would be the correct equation?

- 1) $\frac{I}{Pr} = t$ 2) $\frac{I-r}{P} = t$ 3) $\frac{Pr}{I} = t$ 4) $\frac{r-I}{P} = t$

5) The zeros of the function $f(x) = 3x^2 + 6x - 24$ would be:

- 1) 4 and -2 2) -4 and 2 3) 4 and 2 4) -4 and -2

6) When $(4 - 2x)^2$ is subtracted from $4x^2 + 16$ the result would be:

- 1) 0 2) $16x$ 3) $8x^2 - 16x$ 4) $32 - 16x$

7) When factored completely, $x^4 - 9x^2$ would be equivalent to:

- 1) $x^2(x^2 - 9)$ 2) $(x - 3)(x + 3)$ 3) $x^2(x - 3)(x + 3)$ 4) $(x^2 - 3x)(x^2 + 3x)$

8) Jessica is studying bacteria in biology class. She determines that their population can be modeled by the function $f(x) = 150(.96)^x$. Which statement would not be accurate about this population?

- 1) 4% Growth Rate 2) 150 initial population 3) 4% Decay Rate 4) 122 population when $x = 5$

9) Gerald estimates his gas cost using the function $f(x) = 15x$ where x is the number of hours he has driven since his last fill-up. What percent more would his cost be during a 5 hour trip versus a 3 hour trip?

- 1) 40% 2) 50% 3) 60% 4) 67%

10) Which of the following would be equivalent to $(x - 6)^2 = 32$ if it was solved using completing the square?

- 1) $x^2 - 12x - 4 = 0$ 2) $x^2 - 12x + 4 = 0$
3) $x^2 - 6x - 4 = 0$ 4) $x^2 - 6x + 4 = 0$

11) A cell phone store estimates its monthly revenue using $r(c)$, where c is the number of customers that purchase a cell phone during that month. Which of the following would be the most reasonable domain for this function?

- 1) Real Numbers 2) Positive Real Numbers
3) Positive and Negative Integers 4) Positive Integers

12) Which recursively defined function could be used to model the sequence 2, 5, 26, 677, ...?

- 1) $f(1) = 2, f(n + 1) = (f(n))^2 + 1$ 2) $f(1) = 2, f(n + 1) = 2(f(n)) + 1$
3) $f(1) = 2, f(n + 1) = f(n) + 4$ 4) $f(1) = 2, f(n + 1) = 2^{f(n)} + 1$

13) When $f(x) = |x|$ is transformed to $g(x) = |x + 2| - 3$, which would accurately describe this?

- 1) shift up 2, left 3 2) shift down 3, right 2
3) shift down 3, left 2 3) shift up 2, right 3

14) Solve the following system of equations:

$$\begin{aligned} 2x + 4y &= 19 \\ 6x + 2y &= 22 \end{aligned}$$

15) Put the following function in vertex form and state its minimum value:

$$f(x) = x^2 - 8x + 19$$

16) Your place of employment provides coffee and doughnuts on Friday for everyone to enjoy. The bill for the first Friday is \$23 and for the next Friday it is \$25. On the first Friday there were 10 cups of coffee and 14 doughnuts. On the 2nd Friday there were 8 cups of coffee and 20 doughnuts. The next Friday your boss would like you to purchase 14 cups of coffee and 24 doughnuts. He gives you \$40. How much change should you bring him?

17) A rental car company determines the charge for a customer based on the following function which factors in a standard cost and a per mile cost: $c(x) = .75x + 100$. Explain what the .75, the x , and the 100 represents.

18) The flight of a rock that is thrown can be represented by $h(t) = -8t^2 + 64t + 5$ where t is the time in seconds since its release and $h(t)$ represents the height in feet above the ground. At what time is the rock at its highest point? During which time interval is the rock rising in height? At which whole numbered second is the rock on the ground?

19) A bakery specializes in cupcakes and cookies. They are able to make a total combination of 200 cupcakes and cookies, but no more than that. Cupcakes sell for \$2.75 and cookies sell for \$1.25. They want to make at least \$435 each day selling these two items. Sketch a system of inequalities that shows acceptable combinations of cookies/cupcakes so they can reach their goal. If they made and sold 80 cookies and 120 cupcakes, would they meet their goal of \$435 for the day? Make sure to reference your graph in the solution.