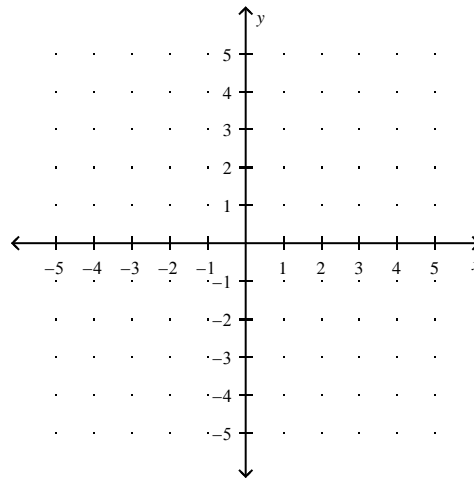


Algebra II
 Chapter 2 – More Test Review – No Calculator

1) Graph the piecewise function.

$$f(x) = \begin{cases} 2x + 1, & \text{when } x < 0 \\ 0, & \text{when } x = 0 \\ -2, & \text{when } x > 0 \end{cases}$$



2) While building her time machine, Prof. Weinstein found that the number of widgets (w) varied directly with the number of henways (h) in the flux capacitor. If there are 12 widgets and 4 henways, find the constant of variation and the function rule.

2) _____

3) Find the vertex: $g(x) = -2|3x - 1| - 3$

3) _____

4) You are planning a spring garden. Tulips bulbs cost \$12.60 per bag and daffodil bulbs cost \$7.35 per bag. You have a budget of \$85. Write a linear model that shows the different numbers of bags of tulip bulbs and daffodil bulbs that you can afford. Include 2 let statements. Write equation in **standard form**.

4) _____

5) Between 2001 and 2011, the average yearly cost of a gnome house increased at a linear rate. In 2001 the average gnome house cost 45 gogos. In 2011 the average gnome house cost 63 gogos. Let $x = 0$ represent the year 2000. Write a linear model that shows the growth of the average cost of a gnome house in gogos. Use 2 let statements. Write the equation in **point slope form**.

5) _____

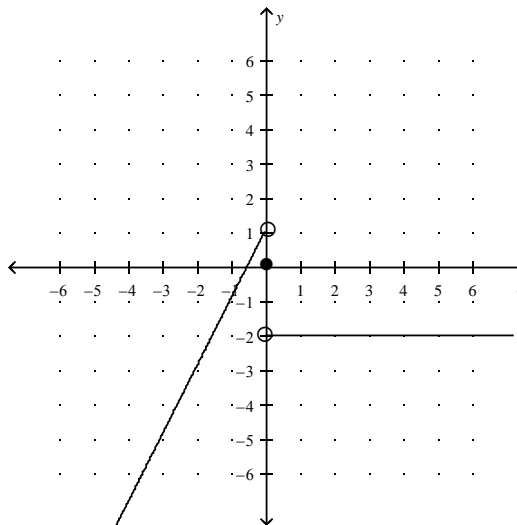
Solutions:

Algebra II

Chapter 2 – More Test Review – No Calculator

1) Graph the piecewise function.

$$f(x) = \begin{cases} 2x + 1, & \text{when } x < 0 \\ 0, & \text{when } x = 0 \\ -2, & \text{when } x > 0 \end{cases}$$



2)

Model of direct variation: $\frac{w}{h} = k$

Substitute to get: $\frac{12}{4} = k$ so $k = 3$ is the constant of variation

And the function rule is $\frac{w}{h} = 3$ or equivalently, $w = 3h$

2) $k = 3$

 $w = 3h$

3) Find the vertex: $g(x) = -2|3x - 1| - 3$

3) $(\frac{1}{3}, -3)$

Find the vertex x -coordinate by setting whatever is inside the absolute value symbols to zero and solving for x :

$$\begin{aligned} 3x - 1 &= 0 \\ 3x &= 1 \\ x &= \frac{1}{3} \end{aligned}$$

Then evaluate the function $x = \frac{1}{3}$:

$$\begin{aligned} g\left(\frac{1}{3}\right) &= -2\left|3\left(\frac{1}{3}\right) - 1\right| - 3 \\ &= -2|1 - 1| - 3 \\ &= -2|0| - 3 \\ &= -2(0) - 3 \\ &= 0 - 3 \\ &= -3 \end{aligned}$$

4) You are planning a spring garden. Tulips bulbs cost \$12.60 per bag and daffodil bulbs cost \$7.35 per bag. You have a budget of \$85. Write a linear model that shows the different numbers of bags of tulip bulbs and daffodil bulbs that you can afford. Include 2 let statements. Write equation in **standard form**.

4) Let x = the number of bags of tulip bulbs
Let y = the number of bags of daffodil bulbs

$$\underline{1260x + 735y = 8500}$$

Assign variables to represent the quantities of each bag. You can assign any variable, but then make sure you keep it the same throughout the problem. (See let statements above, on the answer lines.)

To find the total cost, you need the number of bags of bulbs times the cost of each bag, and then add it together.

Each bag of tulip bulbs costs \$12.60, so the total cost in dollars of tulip bulbs is $12.60x$. Each bag of daffodil bulbs costs \$7.35, so the total cost in dollars of daffodil bulbs is $7.35y$. Add them up to get the total cost, which should equal your budget amount.

$$12.60x + 7.35y = 85$$

But the equation must be written in standard form, so there can be no fractions or decimals. Multiply by 100 to get eliminate the decimals:

$$1260x + 735y = 8500$$

Note that there are other correct forms. Any equivalent relation is fine as long as there are no decimals or fractions.

5) Between 2001 and 2011, the average yearly cost of a gnome house increased at a linear rate. In 2001 the average gnome house cost 45 gogos. In 2011 the average gnome house cost 63 gogos. Let $x = 0$ represent the year 2000.

5) Let x = the year, where $x = 0$ represents 2000

Let y = the cost in gogos

$$\underline{y - 45 = \frac{9}{5}(x - 1)}$$

Write a linear model that shows the growth of the average cost of a gnome house in gogos.

Use 2 let statements. Write the equation in **point slope form**.

It doesn't matter that we don't know what a "gogo" is, we can set up the problem from the given information.

Since the year is already given to us as x , then we can let y be the average cost of a house in gogos. We have two ordered pairs: (2001, 45) and (2011, 63). But we are using 0 to represent the year 2000, so our ordered pairs become (1,45) and (11,63). Use the slope formula to find the slope:

$$slope\ m = \frac{63 - 45}{11 - 1} = \frac{18}{10} = \frac{9}{5}$$

Now use any point in the point-slope formula, with that slope:

$$y - 45 = \frac{9}{5}(x - 1) \quad \text{or, equivalently,} \quad y - 63 = \frac{9}{5}(x - 11)$$