Bellwork Alg 2B Friday, March 16, 2018

1. Describe the Phase Shift (distance and direction) for this Sine Function: $y = -11\text{Sin}(4x - \frac{3\pi}{2}) + 5$

2. $y = x^2 - 6x + 8$

The equation above represents a parabloa in the xy-plane. Which of the following equivalent forms of the equation displays the x-intercepts of the parabola as constants or coefficients?

A) $y - 8 = x^2 - 6x$ B) $y + 1 = (x-3)^2$ C) $y = x(x-6) + 8$ D) $y = (x-2)(x-4)$

3. $ax + by = 12$

$2x + 8y = 60$

In the system of equations above, a and b are constants. If the system has infinitely many solutions, what is the value of $\frac{a}{b}$?

4. $y = 3$

$y = ax^2 + b$

In the system of equations above, a and b are constants. For which of the following values of a and b does the system of equations have exactly two real solutions?

A) $a = -2, b = 2$ B) $a = -2, b = 4$ C) $a = 2, b = 4$ D) $a = 4, b = 3$

Bellwork Alg 2B Friday, March 16, 2018 $\boxed{\text{Answers}}$

1. Describe the Phase Shift (distance and direction) for this Sine Function: $y = -11\text{Sin}(4x - \frac{3\pi}{2}) + 5$

FACTOR OUT THE 4: $y = -11\,\text{Sin}\left(4\left(x - \frac{3\pi}{8}\right)\right) + 5$

PHASE SHIFT: $\boxed{\frac{3\pi}{8} \text{ TO THE RIGHT}}$

2. $y = x^2 - 6x + 8$

The equation above represents a parabloa in the xy-plane. Which of the following equivalent forms of the equation displays the x-intercepts of the parabola as constants or coefficients?

A) $y - 8 = x^2 - 6x$ B) $y + 1 = (x - 3)^2$ C) $y = x(x - 6) + 8$ D) $y = (x - 2)(x - 4)$

↓

FACTORED FORM LEADS TO zeros (x-INTERCEPTS) of 2 & 4

3. $ax + by = 12$

$2x + 8y = 60$

In the system of equations above, a and b are constants. If the system has infinitely many solutions, what is the value of $\frac{a}{b}$?

TO HAVE INFINITELY MANY SOLUTIONS LINES MUST BE PARALLEL (same slope, different y-int)

CHANGE BOTH EQ'S TO SLOPE-INT FORM:

$ax + by = 12$:

$y = \frac{12 - ax}{b} = -\frac{a}{b}x + \frac{12}{b}$

$2x + 8y = 60$:

$y = \frac{60 - 2x}{8} = -\frac{1}{4}x + \frac{15}{2}$

SLOPES MUST BE =

$\frac{a}{b} = \frac{1}{4}$

4. $y = 3$

$y = ax^2 + b$

In the system of equations above, a and b are constants. For which of the following values of a and b does the system of equations have exactly two real solutions?

A) $a = -2, b = 2$ B) $a = -2, b = 4$ C) $a = 2, b = 4$ D) $a = 4, b = 3$

1st USE SUBSTITUTION: $3 = ax^2 + b$

2nd solve for x: $\frac{3 - b}{a} = x^2 \longrightarrow x = \pm\sqrt{\frac{3 - b}{a}}$

2 real solutions means $\frac{3 - b}{a} > 0$

THIS WILL ONLY BE TRUE FOR THE VALUES OF a & b in CHOICE B