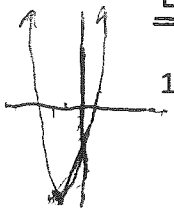
Answer Math 11 Precalculus Key



LG 5 Test B – Part B Show all your work. (Part A answers on back)

1) Explain as much as you can about the following quadratic equation. Include a graph if you think it will help. (vertex, domain, range, direction, intercepts, axis, min/max value)

$$y = 2(x+2)^2 - 18$$

vertex = $(-2,-18)$

domain = $\{x \mid x \in \mathbb{R}\}$

range = $\{y \mid y \geq -18, y \in \mathbb{R}\}$

axis of symmetry: $x = -2$

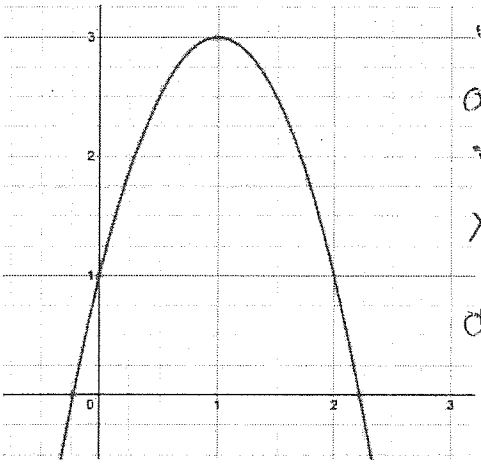
direction = opening up

y intercept = $(0,-10)$

x intercepts = $(1,0)$, $(-5,0)$

minimum: $y = -18$

2) Using the graph below, describe as many properties of this graph of a parabola including coordinates and values that accurately describe the image.



vertex = $(1,3)$

axis of symmetry: $x = 1$

y intercept = $(0,1)$

x intercepts = $(-0.25,0)$
= $(2.25,0)$

direction: opening down

maximum: $y = 3$

domain = $\{x \mid x \in \mathbb{R}\}$

range = $\{y \mid y \leq 3, y \in \mathbb{R}\}$

3) On the coordinate grid below, sketch the graph of the following quadratic equation.

$$y = 2x^2 - 12x + 10$$

(vertex)

$y = 2(x^2 - 6x + 9) + 10 - 18$

$y = 2(x-3)^2 - 8$

$(3,-8)$

(y int)

$y = 2(0)^2 - 12(0) + 10$

$y = 10$

(x int)

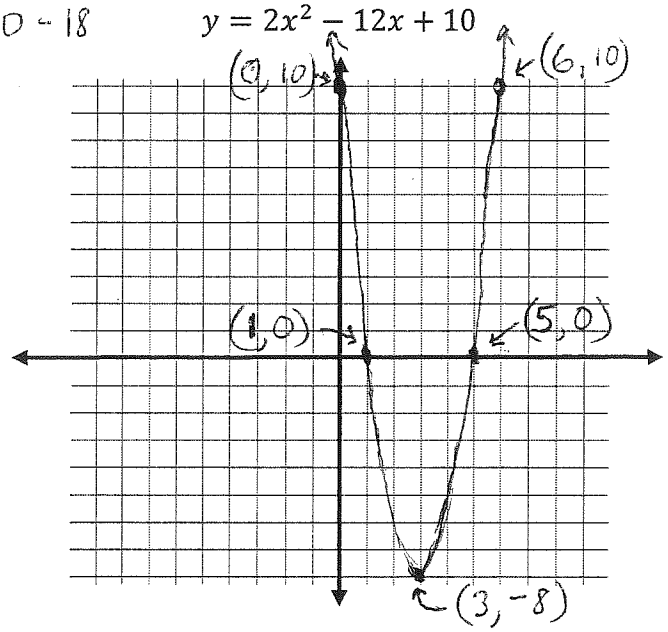
$0 = 2(x-3)^2 - 8$

$\frac{8}{2} = \frac{2}{2}(x-3)^2$

$4 = (x-3)^2$

$\pm 2 = x - 3$

$x = 3 \pm 2$



4) Use completing the square technique to convert the following equation from standard form into vertex form.

$$y = -2x^2 + 10x - 8$$

$\left(\frac{5}{2}\right)^2 = \frac{25}{4}$

$y = -2(x^2 - 5x \quad) - 8$

$y = -2\left(x^2 - 5x + \frac{25}{4}\right) - 8 + \frac{25}{2}$

$y = -2\left(x - \frac{5}{2}\right)^2 + 4\frac{1}{2}$

5) The fuel consumption for a vehicle is related to the speed that it is driven. Engines are generally more efficient at higher speeds than at lower speeds. For a particular type of car driving at a constant speed, the fuel consumption, *C*, in litres per one hundred thousand kilometres, is related to the average driving speed, *v*, in kilometres per hour, by the function...

$$C = 4v^2 - 600v + 30{,}000$$

Determine the most efficient speed at which this car should be driven in order to keep the fuel cost at a minimum.

$\left(\frac{150}{2}\right)^2 = 75^2$

$C = 4(V^2 - 150V + 5625) + 30{,}000 - 22{,}500$

$C = 4(V - 75)^2 + 7{,}500$

$V - 75 = 0$

$V = 75 \frac{Km}{hr}$

Answers for page 1 - Multiple Choice

① C ② A ③ B ④ B ⑤ C ⑥ A ⑦ D ⑧ D