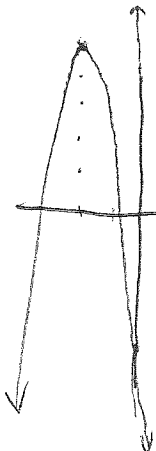


LG 5 Test A – Part B Show all your work. (Part A answers on back.)



- 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)

vertex = $(-2, 5)$
 axis of symmetry = $x = -2$
 direction: down
 maximum: $y = 5$

$$y = -3(x + 2)^2 + 5$$

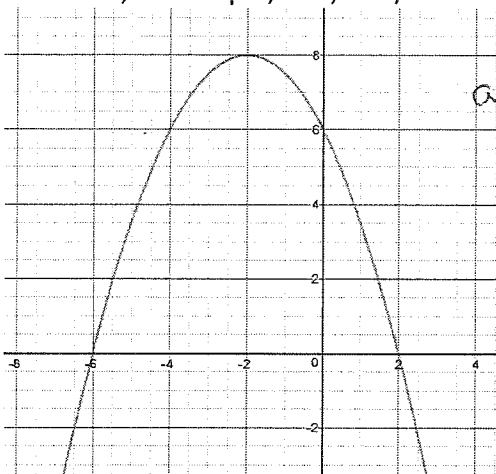
domain = $\{x \mid x \in \mathbb{R}\}$

range = $\{y \mid y \leq 5, y \in \mathbb{R}\}$

y intercept: $(0, -7)$

x intercepts: $(-0.71, 0), (-3.3, 0)$

- 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, domain, range, direction, intercepts, axis, min/max value)



vertex: $(-2, 8)$

axis of symmetry: $x = -2$

direction: down

maximum: $y = 8$

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

range: $\{y \mid y \leq 8, y \in \mathbb{R}\}$

y intercept: $(0, 6)$

x intercepts: $(-6, 0), (2, 0)$

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

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

vertex

$$y = -2(x^2 - 6x) - 10$$

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

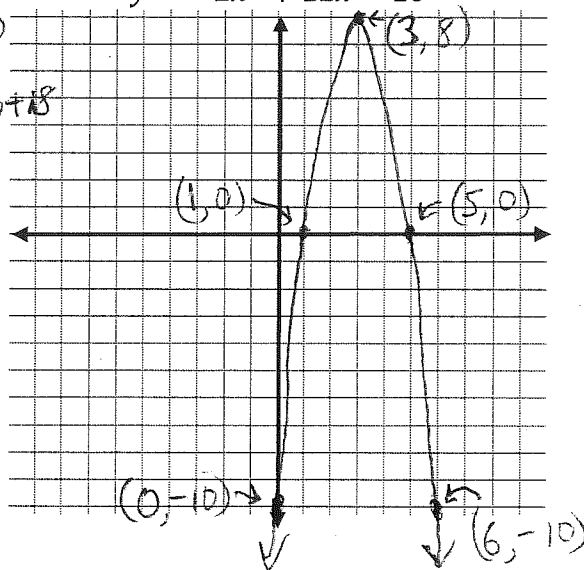
$$y = -2(x - 3)^2 + 8$$

$(3, 8)$

y intercept

$$y = -2(0 - 3)^2 + 8 = -18 + 8$$

$$y = -10$$



x intercepts

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

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

$$4 = (x - 3)^2$$

$$\pm 2 = x - 3$$

$$x = 3 \pm 2$$

$$= 5, 1$$

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

$$y = 2x^2 - 7x + 8$$

$$y = 2 \left(x^2 - \frac{7}{2}x + \quad \right) + 8$$

$$\frac{7}{2} \times \frac{1}{2} = \frac{7}{4}$$

$$y = 2 \left(x^2 - \frac{7}{2}x + \frac{49}{16} \right) + 8 - \frac{49}{8}$$

$$\left(\frac{7}{4} \right)^2 = \frac{49}{16}$$

$$* y = 2 \left(x - \frac{7}{4} \right)^2 + \frac{15}{8}$$

or

$$* y = 2 (x - 1.75)^2 + 1.875$$

- 5) During a kickoff in a football game, the football flies according to the equation: $y = -4.5x^2 + 22.5x$. Determine the **coordinates** of the maximum height the football reaches when it is in the air.

$$y = -4.5 (x^2 - 5x + \quad)$$

$$y = -4.5 (x^2 - 5x + 6.25) + 28.125$$

$$y = -4.5 (x - 2.5)^2 + 28.125$$

$$\text{Vertex} = (2.5; 28.125)$$

Answers for page 1 - Multiple Choice

- ① A ② C ③ B ④ B ⑤ B ⑥ C ⑦ D ⑧ D