

Directions: Answer the following question(s).

- 1 Mark is asked to find the maximum value of the function shown.

$$f(x) = -x^2 + 4x + 4$$

He decides to complete the square to reveal the maximum value. Which shows the function Mark created, and the maximum value of this function?

- A.  $f(x) = (x - 2)^2 + 4$ , and the maximum value of  $f(x)$  is 4.
- B.  $f(x) = -(x - 2)^2$ , and the maximum value of  $f(x)$  is 0.
- C.  $f(x) = -(x - 2)^2 + 8$ , and the maximum value of  $f(x)$  is 8.
- D.  $f(x) = -(x - 2)^2 - 4$ , and the maximum value of  $f(x)$  is  $-4$ .

- 2 What is the maximum value of the function?

$$g(y) = -y^2 + 12y + 45$$

- A. 81
- B. 9
- C. 189
- D.  $-99$

- 3 Enter an equation for the line of symmetry for the function defined by  $f(x) = 4x^2 + 8x + 3$ .

Use the on-screen keyboard to type your answer in the box below.

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- 4 April completed the square to find the minimum value of the function  $f(x) = x^2 + 6x + 7$ . Which value did she place in the blank?

$$f(x) = (x + 3)^2 + 7 + (\_)$$

- A. 9
- B.  $-9$
- C.  $-3$
- D. 3

- 5 Sandra wants to find the point on the graph where the minimum value of this equation occurs.

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

She completes the square to find the minimum value. Which function is equivalent to the original function, and at what point does the minimum value occur?

- A.  $y = (x - 3)^2 - 1$ , with the minimum at  $(3, -1)$
- B.  $y = (x - 3)^2 - 1$ , with the minimum at  $(-3, -1)$
- C.  $y = (x - 3)^2 + 17$ , with the minimum at  $(-3, 17)$
- D.  $y = (x - 3)^2 + 17$ , with the minimum at  $(3, -17)$

- 6 The temperature, in Celsius, of a certain substance during a chemistry experiment at time  $t$  minutes is modeled by the expression below.

$$t^2 - 15t + 54$$

Which expression is equivalent to the above expression and BEST reveals the minimum temperature reached by the substance?

- A.  $(t + 6)(t + 9)$
- B.  $(t - 7.5)^2 + 2.25$
- C.  $(t - 7.5)^2 - 2.25$
- D.  $(t - 6)(t - 9)$

- 7 Enter an equation for the line of symmetry for the function defined by  $f(x) = 2x^2 - 20x - 7$ .

Use the on-screen keyboard to type your answer in the box below.

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