

F.IF.C.8: Vertex Form of a Quadratic

- 1 In the function $f(x) = (x - 2)^2 + 4$, the minimum value occurs when x is
 - 1) -2
 - 2) 2
 - 3) -4
 - 4) 4

- 2 If Lylah completes the square for $f(x) = x^2 - 12x + 7$ in order to find the minimum, she must write $f(x)$ in the general form $f(x) = (x - a)^2 + b$. What is the value of a for $f(x)$?
 - 1) 6
 - 2) -6
 - 3) 12
 - 4) -12

- 3 The function $f(x) = 3x^2 + 12x + 11$ can be written in vertex form as
 - 1) $f(x) = (3x + 6)^2 - 25$
 - 2) $f(x) = 3(x + 6)^2 - 25$
 - 3) $f(x) = 3(x + 2)^2 - 1$
 - 4) $f(x) = 3(x + 2)^2 + 7$

- 4 Which equation is equivalent to $y - 34 = x(x - 12)$?
 - 1) $y = (x - 17)(x + 2)$
 - 2) $y = (x - 17)(x - 2)$
 - 3) $y = (x - 6)^2 + 2$
 - 4) $y = (x - 6)^2 - 2$

- 5 Which equation and ordered pair represent the correct vertex form and vertex for $j(x) = x^2 - 12x + 7$?
 - 1) $j(x) = (x - 6)^2 + 43, (6, 43)$
 - 2) $j(x) = (x - 6)^2 + 43, (-6, 43)$
 - 3) $j(x) = (x - 6)^2 - 29, (6, -29)$
 - 4) $j(x) = (x - 6)^2 - 29, (-6, -29)$

- 6 a) Given the function $f(x) = -x^2 + 8x + 9$, state whether the vertex represents a maximum or minimum point for the function. Explain your answer.
b) Rewrite $f(x)$ in vertex form by completing the square.

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Answer Section

1 ANS: 2 REF: 011601ai

2 ANS: 1

$$x^2 - 12x + 7$$

$$x^2 - 12x + 36 - 29$$

$$(x - 6)^2 - 29$$

REF: 081520ai

3 ANS: 3

$$3(x^2 + 4x + 4) - 12 + 11$$

$$3(x + 2)^2 - 1$$

REF: 081621ai

4 ANS: 4

$$y - 34 = x^2 - 12x$$

$$y = x^2 - 12x + 34$$

$$y = x^2 - 12x + 36 - 2$$

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

REF: 011607ai

5 ANS: 3

$$j(x) = x^2 - 12x + 36 + 7 - 36$$

$$= (x - 6)^2 - 29$$

REF: 061616ai

6 ANS:

The vertex represents a maximum since $a < 0$. $f(x) = -x^2 + 8x + 9$

$$= -(x^2 - 8x - 9)$$

$$= -(x^2 - 8x + 16) + 9 + 16$$

$$= -(x - 4)^2 + 25$$

REF: 011536ai