Algebra I Practice F.IF.C.8: Vertex Form of a Quadratic

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1. Compare the quantity in Column A with the quantity in Column B.

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

Column A	Column B
maximum value of $f(x)$	$f(3)$

   [A] The quantity in Column A is greater.

   [B] The quantity in Column B is greater.

   [C] The two quantities are equal.

   [D] The relationship cannot be determined on the basis of the information supplied.

2. The French Bakery sells more croissants when it reduces its price. The profit is modeled by the function $y = -0.2(x-60)^2 + 150$, where x is the number of croissants sold per day. What is the maximum profit the bakery can make?

3. Write in standard form (for a parabola):

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

   [A] $y = (x+6)^2 + 142$

   [B] $y = (x+6)^2 - 34$

   [C] $y = (x+6)^2 - 38$

   [D] $y = (x+6)^2 + 34$

4. Write in standard form (for a parabola):

   $y = x^2 - 8x + 1$

   [A] $y = (x-4)^2 - 15$

   [B] $y = (x-4)^2 + 17$

   [C] $y = (x-4)^2 - 17$

   [D] $y = (x-4)^2 + 65$

5. Write in standard form (for a parabola):

   $y = x^2 + 14x + 2$

   [A] $y = (x+7)^2 - 47$

   [B] $y = (x+7)^2 - 51$

   [C] $y = (x+7)^2 + 198$

   [D] $y = (x+7)^2 + 51$

6. Write in standard form (for a parabola):

   $y = x^2 + 8x + 4$

   [A] $y = (x+4)^2 + 68$

   [B] $y = (x+4)^2 - 20$

   [C] $y = (x+4)^2 + 20$

   [D] $y = (x+4)^2 - 12$

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7. Rewrite the equation of a parabola in vertex form. $y = x^2 + 14x + 51$

   [A] $y = (x+14)^2 + 9$ [B] $y = (x+7)^2 - 2$

   [C] $y = (x+14)^2 - 9$ [D] $y = (x+7)^2 + 2$

8. Rewrite the equation of a parabola in vertex form. $y = x^2 + 10x + 19$

   [A] $y = (x+10)^2 - 1$ [B] $y = (x+5)^2 + 6$

   [C] $y = (x+5)^2 - 6$ [D] $y = (x+10)^2 + 1$

9. Rewrite the equation of a parabola in vertex form. $y = x^2 - 16x + 59$

10. Rewrite the equation of a parabola in vertex form. $y = x^2 - 2x - 3$

11. Rewrite the equation of a parabola in vertex form. $y = x^2 + 6x + 16$

12. Rewrite the equation of a parabola in vertex form. $y = x^2 - 10x + 34$

13. Find p, q, and r so that this equation is a parabola: $px^2 + qy^2 + 2x + 6y + r = 0$

14. The daily profit of a custom T-shirt shop can be modeled by $P(n) = -n^2 + 60n - 400$, where n is the number of T-shirts produced each day and $P(n)$ is the profit made on that number. Rewrite this function in vertex form and determine the maximum daily profit.

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[1] A

[2] $150

[3] C

[4] A

[5] A

[6] D

[7] D

[8] C

[9] $y = (x-8)^2 - 5$

[10] $y = (x-1)^2 - 4$

[11] $y = (x+3)^2 + 7$

[12] $y = (x-5)^2 + 9$

[13] Answers may vary. Sample: (Either p or q must be zero) $p = 1,\ q = 0,\ r = 12$

[14] $P(n) = -(n-30)^2 + 500$; $500 is the maximum profit.