

A.A.41: Determine the vertex and axis of symmetry of a parabola, given its equation.

1. 060918ia, P.I. A.A.41

What are the vertex and axis of symmetry of the parabola $y = x^2 - 16x + 63$?

[A] vertex: (8,1); axis of symmetry: $x = 8$

[B] vertex: (8,-1); axis of symmetry: $x = 8$

[C] vertex: (-8,1); axis of symmetry: $x = -8$

[D] vertex: (-8,-1); axis of symmetry: $x = -8$

2. 080902b, P.I. A.A.41

What are the coordinates of the turning point of the parabola whose equation is

$$y = -x^2 + 4x + 1?$$

[A] (-2,-11) [B] (2,13)

[C] (2,5) [D] (-2,-3)

3. 080501b, P.I. A.A.41

What is the turning point, or vertex, of the parabola whose equation is $y = 3x^2 + 6x - 1$?

[A] (-3,8) [B] (1,8)

[C] (3,44) [D] (-1,-4)

4. 080603b, P.I. A.A.41

What is the minimum point of the graph of the equation $y = 2x^2 + 8x + 9$?

[A] (2,33) [B] (-2,1)

[C] (-2,-15) [D] (2,17)

5. 080934ia, P.I. A.A.41

Find algebraically the equation of the axis of symmetry and the coordinates of the vertex of the parabola whose equation is

$$y = -2x^2 - 8x + 3.$$

6. 060514b, P.I. A.A.41

For which quadratic equation is the axis of symmetry $x = 3$?

[A] $y = x^2 + x + 3$ [B] $y = x^2 + 6x + 3$

[C] $y = -x^2 + 6x + 2$ [D] $y = -x^2 + 3x + 5$

7. fall9915b, P.I. A.A.41

A model rocket is launched from ground level. Its height, h meters above the ground, is a function of time t seconds after launch and is given by the equation

$h = -4.9t^2 + 68.6t$. What would be the maximum height, to the *nearest meter*, attained by the model?

[A] 243 [B] 241 [C] 240 [D] 242

8. 010907b, P.I. A.A.41

The height of a swimmer's dive off a 10-foot platform into a diving pool is modeled by the equation $y = 2x^2 - 12x + 10$, where x represents the number of seconds since the swimmer left the diving board and y represents the number of feet above or below the water's surface. What is the farthest depth below the water's surface that the swimmer will reach?

[A] 8 feet [B] 12 feet
[C] 6 feet [D] 10 feet

9. 010424b, P.I. A.A.41

When a current, I , flows through a given electrical circuit, the power, W , of the circuit can be determined by the formula

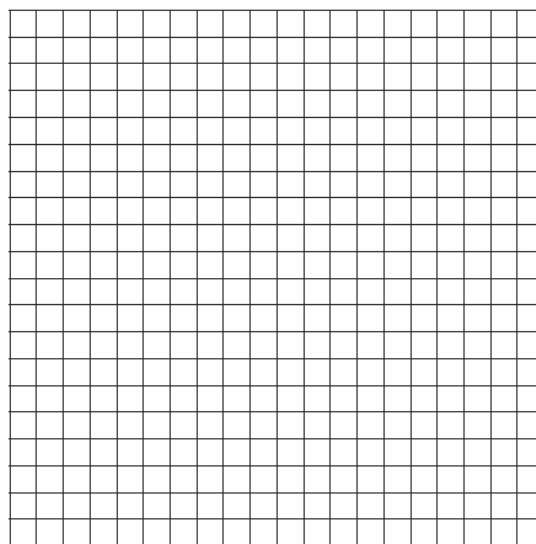
$W = 120I - 12I^2$. What amount of current, I , supplies the maximum power, W ?

10. 060225b, P.I. A.A.41

The equation $W = 120I - 12I^2$ represents the power (W), in watts, of a 120-volt circuit having a resistance of 12 ohms when a current (I) is flowing through the circuit. What is the maximum power, in watts, that can be delivered in this circuit?

11. 060822b, P.I. A.A.41

A laundry owner's estimate of her weekly profits, p , in dollars, is given by the equation $p = -4w^2 + 160w$, where w represents the number of workers she hires. What is the number of workers she should hire in order to earn the greatest profit? [The use of the grid is optional.]



A.A.41: Determine the vertex and axis of symmetry of a parabola, given its equation.

[1] B _____

[2] C _____

[3] D _____

[4] B _____

[3] $x = -2$ and $(-2,11)$, and appropriate algebraic work is shown.

[2] Appropriate work is shown, but one computational error is made.

or [2] An incorrect equation of the axis of symmetry is written, but an appropriate vertex is found.

or [2] $x = -2$ and $y = 11$, and appropriate work is shown, but the vertex is not stated as a point.

[1] Appropriate work is shown, but two or more computational errors are made.

or [1] Appropriate work is shown, but one conceptual error is made, such as not expressing the axis of symmetry as an equation.

or [1] $x = -2$ and $(-2,11)$, but a method other than algebraic is used.

or [1] Appropriate work is shown to find $x = -2$, but no further correct work is shown.

or [1] Appropriate work is shown to find $(-2,11)$, but no further correct work is shown.

or [1] $x = -2$ and $(-2,11)$, but no work is shown.

[0] $x = -2$ or $(-2,11)$, but no work is shown.

or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an

[5] obviously incorrect procedure. _____

[6] C _____

[7] C _____

[8] A _____

[2] 5, and appropriate work is shown.

[1] Appropriate work is shown, but one computational error is made.

or [1] Appropriate work is shown, but one conceptual error is made.

or [1] 5, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[9] incorrect procedure. _____

[2] 300, and appropriate work is shown.

[1] Appropriate work is shown, but one computational error is made.

or [1] 300, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[10] incorrect procedure. _____

[2] 20, and appropriate work is shown, such as finding the turning point or sketching the graph of the equation.

[1] Appropriate work is shown, but one computational or graphing error is made.

or [1] Appropriate work is shown, but one conceptual error is made.

or [1] The graph of the equation is sketched correctly, but no further correct work is shown.

or [1] (20,1600) is identified as the turning point, but the number of workers is not stated.

or [1] 20, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[11] incorrect procedure. _____