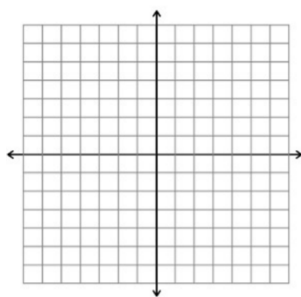


3.1, #10: For the quadratic function

$$k(x) = 2(x - 3)^2 - 2,$$

- (a) Determine whether the graph of the parabola opens upward or downward.
- (b) Identify the vertex.
- (c) Determine the x -intercept(s).
- (d) Determine the y -intercept.

(e) Sketch the graph below.



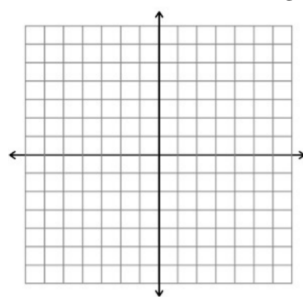
- (f) Determine the axis of symmetry.
- (g) Determine the maximum or minimum value of the function.
- (h) Write the domain and range in interval notation.

3.1, #14: For the quadratic function

$$q(x) = -\frac{1}{3}(x - 1)^3 + 1,$$

- (a) Determine whether the graph of the parabola opens upward or downward.
- (b) Identify the vertex.
- (c) Determine the x -intercept(s).
- (d) Determine the y -intercept.

(e) Sketch the graph below.



- (f) Determine the axis of symmetry.
- (g) Determine the maximum or minimum value of the function.
- (h) Write the domain and range in interval notation.

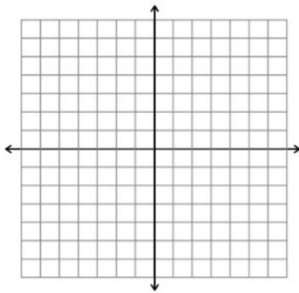
3.1, #28: Find the vertex of the parabola $j(t) = -\frac{1}{4}t^2 + 10t - 5$. Then, find the discriminant and state what it means about the x -intercepts of j .

3.1, #48: The gas mileage $m(x)$ (in mpg) for a certain vehicle can be approximated by $m(x) = -0.028x^2 + 2.688x - 35.012$, where x is the speed of the vehicle in mph. Determine the speed at which the car gets its maximum gas mileage and what the maximum gas mileage is.

3.1, #20: For the quadratic function $d(x) = -3x^2 - 12 - 7$,

- Write the function in vertex form.
- Identify the vertex.
- Determine the x -intercept(s).
- Determine the y -intercept.

(e) Sketch the graph below.

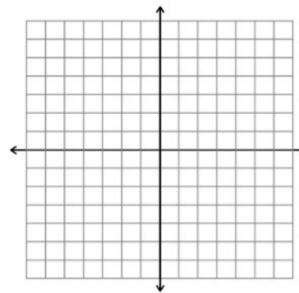


- Determine the axis of symmetry.
- Determine the maximum or minimum value of the function.
- Write the domain and range in interval notation.

3.1, #40: For the quadratic function $m(x) = 2x^2 - 8x + 8$,

- Determine whether the graph of the parabola opens upward or downward.
- Identify the vertex.
- Determine the x -intercept(s).
- Determine the y -intercept.

(e) Sketch the graph below.



- Determine the axis of symmetry.
- Determine the maximum or minimum value of the function.
- Write the domain and range in interval notation.

3.1, #52: The difference of two numbers is 30. What two numbers will minimize the product?

3.2, #18: Determine the leading term and the end behavior for $n(x) = -2(x + 4)(3x - 1)^3(x + 5)$.

3.2, #28: Find the zeros of the function $n(x) = x^6 + 4x^5 + 4x^4$, state each of their multiplicities, and state whether each zero is a “touch point” or “cross point.”