

Graphing from a TOV

Graph $y = -3x^2 - 3x - 4$ by creating a table of values (use x -values from -2 to +2).

Solutions

Points in your table should be (-2, -10), (-1, -4), (0, -4), (1, -10), (2, -22).

Graphing Quadratic Equations in Vertex Form

a) State the transformations, using proper vocabulary, for each of the following equations.

b) Graph each of the following by hand on graph paper, showing at least 5 points. Check your graphs using Desmos.

1. $y = (x-2)^2 + 5$

2. $y = 3(x+2)^2$

3. $y = -2(x+3)^2$

4. $y = (x+4)^2 + 3$

5. $y = \frac{1}{3}(x-3)^2$

6. $y = -\frac{1}{2}(x-5)^2 + 3$

7. $y = (x-4)^2 - 1$

8. $y = -(x+2)^2 - 5$

9. $y = 5(x-2)^2 - 3$

10. $y = (x+6)^2 - 7$

11. $y = -(x+1)^2 + 5$

12. $y = -3(x+4)^2 + 7$

13. $y = 2x^2 + 3$

14. $y = 2(x+1)^2 - 3$

15. $y = -\frac{1}{3}(x-5)^2 - 1$

16. $y = \frac{1}{2}x^2 - 4$

17. $y = \frac{1}{4}(x-3)^2 + 2$

18. $y = \frac{1}{2}(x+5)^2 - 7$

Select Solutions for part a)

6. Reflection in the x -axis, vertical compression by a factor of 2, horizontal translation 5 units right and vertical translation 3 units up.

14. Vertical stretch by a factor of 2, horizontal translation 1 unit left and vertical translation 3 units down.

Finding Quadratic Equations in Vertex Form

Find the equation of each quadratic relation in **vertex form** by calculating the stretch factor **algebraically**.

1. With vertex (2,3) and passing through the point (-1,12).

2. With vertex (3,-2) and a y -intercept of 1.

3. With vertex (3,5) and x -intercepts of 2 and 4.

Solutions

1. $y = (x-2)^2 + 3$

2. $y = \frac{1}{3}(x-3)^2 - 2$

3. $y = -5(x-3)^2 + 5$

Graphing Quadratic Equations in Factored Form

Graph each of the following equations on graph paper, by hand, showing the zeros and vertex. Check your answers using Desmos.

1. $y = (x-2)(x-6)$

2. $y = \frac{1}{2}(x+5)(x+1)$

3. $y = 4(x+1)(x-1)$

4. $y = 3x(x-5)$

5. $y = -(x+3)(x-7)$

6. $y = -2(x-3)(x+1)$

Finding Quadratic Equations in Factored Form

Find the equation of each quadratic relation in **factored form** by calculating the stretch factor **algebraically**.

- With x-intercepts of 1 and -4, and passing through the point (2,-6).
- Having the following table of values.

| x | y |
|----|-----|
| -3 | 0 |
| -2 | -12 |
| -1 | -18 |
| 0 | -18 |
| 1 | -12 |
| 2 | 0 |
| 3 | 18 |

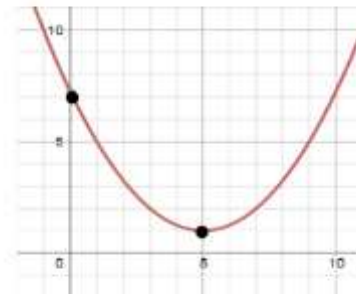
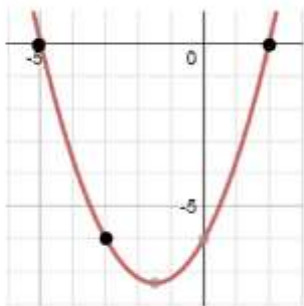
- With zeros of 4 and 0 that also passes through the point (1,-15).

Solutions

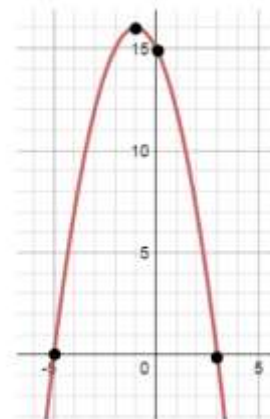
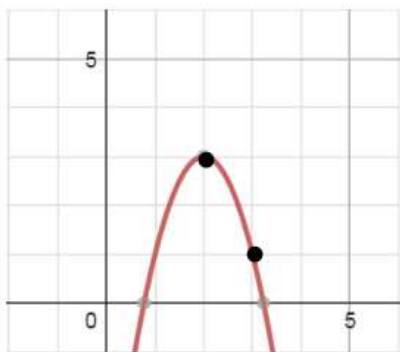
- $y = -1(x + 4)(x - 1)$
- $y = 3(x + 3)(x - 2)$
- $y = 5x(x - 4)$

Finding Quadratic Equations from Graphs

- Find the equation in **factored form** by calculating the stretch factor **algebraically**.
- Find the equation in **vertex form** by calculating the stretch factor **algebraically**.



- Find the equation in **vertex form without** calculating the stretch factor algebraically.
- Find the equation in **factored form without** calculating the stretch factor algebraically.



Solutions

- $y = \frac{3}{5}(x - 2)(x + 5)$
- $y = \frac{6}{25}(x - 5)^2 + 1$
- $y = -2(x - 2)^2 + 3$
- $y = -(x - 3)(x + 5)$