12.2 Solve Quadratics by Graphing

This section requires GRAPHING CALCULATOR!

SOLVE

\[
0 = 2x^2 - 3x - 7
\]

Roots =

x-intercepts =

Max/Min =

zero(s) =

Vertex =

Solve by graphing!

\[
2x^2 = x - 5
\]
Find the max/min by graphing! Sketch a graph.

\[ 0 = 2x^2 + 3x - 5 \quad \text{and} \quad 0 = 0.6x^2 + 7.5x + 8 \]

Cliff diver Kelly stands on a 70 foot cliff. He jumps with an initial velocity of 8 ft/sec.  

\[ s(t) = -16t^2 + vt + h \]

\[ s(t) = \text{height of object} \]
\[ v = \text{initial velocity} \]
\[ h = \text{initial height} \]

Graph in the calculator with a “friendly window”.

\[ x_{\text{min}} = \quad y_{\text{min}} = \]
\[ x_{\text{max}} = \quad y_{\text{max}} = \]
\[ x_{\text{scl}} = \quad y_{\text{scl}} = \]

When will Mr. Kelly hit the water?

What is Mr. Kelly’s maximum height?

**SUMMARY:**

Now, summarize your notes here!
## 12.2 Solve Quadratics by Graphing

| Find the coordinates of the zeros and vertex using the graph of the function. |
|---|---|---|
| 1. | 2. | 3. |
| Zeros: | Zeros: | Zeros: |
| Vertex: | Vertex: | Vertex: |
| Is the vertex a maximum or minimum? | Is the vertex a maximum or minimum? | Is the vertex a maximum or minimum? |

| Find the roots and vertex of the function by graphing. Sketch a rough graph. Round to the nearest hundredth. |
|---|---|
| 4. $f(x) = -x^2 - 3x + 4$ | 5. $f(x) = \frac{1}{2}x^2 + 4x + 5$ |
| Roots: | Roots: |
| Vertex: | Vertex: |
| Is the vertex a maximum or minimum? | Is the vertex a maximum or minimum? |

| 6. $f(x) = -2x^2 + 11x - 8$ | 7. $f(x) = 0.2x^2 + 3x - 5$ |
| Roots: | Roots: |
| Vertex: | Vertex: |
| Is the vertex a maximum or minimum? | Is the vertex a maximum or minimum? |
Solve the equation by graphing. Round to the nearest hundredth.

<table>
<thead>
<tr>
<th>Equation</th>
<th>8. $2x^2 + x - 3 = 0$</th>
<th>9. $-4x^2 - 4x + 1 = 0$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equation</td>
<td>10. $3x^2 + 1 = 2x$</td>
<td>11. $\frac{1}{2}x^2 = 3 + 2x$</td>
</tr>
</tbody>
</table>

Graph to answer the following. Round to the nearest hundredth.

<table>
<thead>
<tr>
<th>Equation</th>
<th>12. Find the zeros of $f(x) = -\frac{1}{2}x^2 - 6x - 5$</th>
<th>13. What is the maximum point for $y = -x^2 + 22$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equation</td>
<td>14. Explain why there is no solution to the following: $f(x) = 0.6x^2 - 2x + 5$</td>
<td></td>
</tr>
</tbody>
</table>

**SKILLZ REVIEW**

<table>
<thead>
<tr>
<th>Skill</th>
<th>1. $2x + y = -3$</th>
<th>2. $x^2 + 2x - 80$</th>
<th>3. Simplify $\sqrt{75}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skill</td>
<td>4. $x - 2y = 10$</td>
<td>5. $2x^2 - 5x - 3$</td>
<td>6. Simplify $\frac{2}{\sqrt{2}}$</td>
</tr>
</tbody>
</table>
12.2 Solve Quadratics by Graphing

1. Solve using the graphing calculator. (Round to nearest hundredth).
   \[ 0 = -3x^2 + 4x + 5 \]

2. What is the minimum point of \((x) = 6x^2 + 2x - 3\)?

TRANSLATIONS!
Translating a graph means sliding it around. Figure out how to move a parabola up/down/left/right using the calculator. Think Golden Arches where the left parabola slides over to make the right parabola.

3. The most basic quadratic is \(y = x^2\).
   Graph \(y = x^2\) on calculator with a standard window (ZOOM 6).
   Use this graph to compare to #4-10 below.

4. Move your \(y = x^2\) graph up 3 places. Write the equation that does this.

5. Move your \(y = x^2\) graph down 5 places. Write the equation that does this.

6. Flip your \(y = x^2\) graph upside down. Write the equation that does this.

7. Graph \(y = (x - 3)^2\). Describe its translation (how it moved) from the original graph of \(y = x^2\).

8. Move your \(y = x^2\) graph left 5 places. Write the equation that does this.

9. Move your \(y = x^2\) graph right 2 places and up 4 places.
   Write the equation that does this.

10. Flip your \(y = x^2\) graph upside down and move 1 left and 6 down.
    Write the equation that does this.

11. Write the equation of the following graph.
12. Use the graph to approximate the following:

Roots:

Maximum(s):

Minimum(s):

y-intercept:

\( f(-4) = \)

13. Write the window that displays the graph to the right.

14. Mr. Kelly enters a 24 hour Magic “The Gathering” card tournament. The function shows Mr. Kelly’s total cards during the 24 hour tournament. \( y = -\frac{1}{4}x^2 + 4x + 32 \) where \( x \) is hours since the start of the tournament and \( y \) is total cards.

a. Graph with a “friendly” window. Record window here.

b. What is the maximum amount of cards Mr. Kelly will have?

c. How many cards will Mr. Kelly have at 5 hours?

d. When will Mr. Kelly run out of cards?