Practice Problems #9...

1a) \( x = -9 \) or \( x = 5 \)  
1c) \( x = \frac{3}{2} \) or \( x = -\frac{3}{2} \)  
1e) \( x = -3 \) or \( x = 1 \)

2a) \( x = -4 \) or \( x = 4 \)  
2c) \( t = 2 \) or \( t = -2 \)  
2e) \( x = 0 \) or \( x = -2 \)

3a) \( x = -5 \) or \( x = -3 \)  
3c) \( x = 1 + \sqrt{3} \) or \( x = 1 - \sqrt{3} \)  
3e) \( x = -2 + i\sqrt{2} \) or \( x = -2 - i\sqrt{2} \)

4a) \( x = \frac{1}{2} \) or \( x = -4 \)  
4c) \( x = 4 + 3i\sqrt{2} \) or \( x = 4 - 3i\sqrt{2} \)  
4e) \( x = 1 + \frac{1}{2}i\sqrt{2} \) or \( x = 1 - \frac{1}{2}i\sqrt{2} \)

5b) \( \sqrt{76} = 8.72 \)

6a) About 89.44 feet  
6c) About 1280.62 feet  
6e) About 9.54 feet

7a) About 1.94 seconds  
7c) About 8.29 seconds  
7e) After about 1.13 seconds and again after about 2 seconds.

8a) \( x = \pm \frac{2}{3} \) or \( x = \pm 3 \)  
8c) \( x = 8 \) or \( x = 27 \)

Practice Problems #10...

**Remember:** A good graph has the axes labeled, the scale indicated, and important points labeled with ordered-pair notation.

1a) Opens upwards with vertex at \((2, -4)\), y-int at \((0, 0)\), and x-ints at \((0, 0)\) and \((4, 0)\)

1c) Opens upwards with vertex at \((0, -4)\), y-int at \((0, -4)\), and x-ints at \((-2, 0)\) and \((2, 0)\)

1d) Opens downwards with vertex at \((0, 4)\), y-int at \((0, 4)\), and x-ints at \((-2, 0)\) and \((2, 0)\)

1f) Opens upwards with vertex at \((3/2, -1/4)\), y-int at \((0, 2)\), and x-ints at \((1, 0)\) and \((2, 0)\)

1g) Opens downwards with vertex at \((1, 0)\), y-int at \((0, -1)\), and x-int \((1, 0)\) ... only one x-intercept ... this only happens when the vertex is on the x-axis

1j) Opens downwards with vertex at \((-1/2, -47/4)\), y-int at \((0, -12)\), and no x-ints.

1l) Opens downwards with vertex at \((3/2, 9/2)\), y-int at \((0, 0)\), and x-ints at \((0, 0)\) and \((3, 0)\)

2a) Opens upwards with vertex at \((1, -6)\), y-int at \((0, -5)\), and x-ints at \((1 + \sqrt{6}, 0)\) and \((1 - \sqrt{6}, 0)\)

2c) Opens downwards with vertex at \((-3/2, 33/4)\), y-int at \((0, 6)\), and x-ints at \(\left(\frac{-3 + \sqrt{33}}{2}, 0\right)\) and \(\left(\frac{-3 - \sqrt{33}}{2}, 0\right)\)
3a) \( f(x) \geq -9 \)  \hspace{1cm} 3b) \( g(x) \geq -1 \)  \hspace{1cm} 3c) \( y \leq 6 \)  \hspace{1cm} 3d) \( g(x) \geq 3.125 \)  \hspace{1cm} 3f) \( y \leq -11 \)  \hspace{1cm} 3h) \( f(x) \geq 0 \)

4a) \( f(x) = x^2 + 3x - 10 \) is one of infinitely many possible answers

4b) \( f(x) = -432x^2 - 22.132x + 2 \) is one of infinitely many possible answers

4c) \( f(x) = x^2 - 4x + 8 \) is one of infinitely many possible answers

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**Practice Problems #11...**

1a) The break-even points are at 30 items or 200 items produced.

1b) If they produce between 80 and 150 items.

1c) Profit is maximized if they produce 115 items.

2a) Between \( t = 0.37 \) seconds and \( t = 7.13 \) seconds

2b) Maximum height is 233 feet.

4a) \( C(0) = 10000, C(50) = 5625, C(100) = 3500, C(150) = 3625 \) ...

   Hmmmm, somewhere between 100 items and 150 items they start “overproducing” (do you see why I say this?)

4b) About 122 items minimizes daily production costs.

5a) \( f(x) = 0 \) when \( x = -1 \) or \( x = 1 \)

5b) \( f(x) = 0 \) when \( x = -5 \) or \( x = 0 \)

5c) \( f(x) = 0 \) when \( x = -2 \) or \( x = 3 \)

6a) \( 0 \leq x \leq 1 \)

6b) \( x < -4 \) or \( x > 0 \)

6d) Always true! Hmmmm: What if it were \( > \) instead of \( \geq \)? (Then it would be all values except \( x = -1/2 \) ... cool, eh?)

6f) \( x \leq -6/5 \) or \( x \geq 3 \)

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**Practice Problems #12...**

1a) Center is \((0, 0)\) and radius is 1

1b) Center is \((0, 0)\) and radius is \( \sqrt{6} = 2.45 \)

1c) Center is \((3, 1)\) and radius is 3

1d) Center is \((-6, 4)\) and radius is 9

1e) Center is \((2, 0)\) and radius is 2

1f) Center is \((0, -3)\) and radius is \( \sqrt{10} = 3.16 \)

2a) Center is \((0, 0)\) and vertices are \((-3, 0)\), \((3, 0)\), \((0, -6)\), and \((0, 6)\)

2b) Center is \((1, 3)\) and vertices are \((5, 3)\), \((-3, 3)\), \((8, 5)\), and \((-2, 5)\)

2e) Center is \((0, 0)\) and vertices are \((-2, 0)\), \((2, 0)\), \((0, -4)\), and \((0, 4)\)

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3a) Center is \((0, 0)\) and vertices are \((-3, 0)\) and \((3, 0)\)

3b) Center is \((0, 0)\) and vertices are \((0, -4)\) and \((0, 4)\)

3e) Center is \((0, 0)\) and vertices are \((0, -1)\) and \((0, 1)\)
<table>
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<tr>
<th>4a)</th>
<th>Circle</th>
<th>4b)</th>
<th>Hyperbola</th>
<th>4c)</th>
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<th>4d)</th>
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<td>4g)</td>
<td>Parabola</td>
<td>4h)</td>
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<tr>
<th>5a)</th>
<th>(2, 4)</th>
<th>5b)</th>
<th>(2, 2)</th>
<th>5d)</th>
<th>(1/2, -1/4)</th>
<th>5e)</th>
<th>(-2, 3), (1, 0)</th>
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<td>(0, 2), (-1, 0)</td>
<td>5n)</td>
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<td>5q)</td>
<td>(0, -1), (2, 1)</td>
<td>5r)</td>
<td>(0, 0), (-3, 3)</td>
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<td>(-1, -2), (5, 4)</td>
<td>5t)</td>
<td>No solution</td>
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