1. **Multiple Choice** Which inequality is not represented by this graph?
   - A. \( y > x^2 - x - 6 \)
   - B. \( y > \left( x - \frac{1}{2} \right)^2 - \frac{25}{4} \)
   - C. \( y > (x + 2)(x - 3) \)
   - D. \( y > (x + 3)(x - 2) \)

2. **Multiple Choice** Which inequality below is represented by this number line?
   - A. \( 2x^2 + 7x - 4 \geq 0 \)
   - B. \( 2x^2 + 7x - 4 \leq 0 \)
   - C. \( -2x^2 - 7x + 4 \geq 0 \)
   - D. \( 2x^2 - 7x + 4 \leq 0 \)

3. **Graph each inequality. Give 2 possible solutions in each case.**
   a) \( 2x^2 - 5x < -2 \)
   
   **Solve:**
   
   \[ 2x^2 - 5x + 2 = 0 \]
   
   \[ (2x - 1)(x - 2) = 0 \]
   
   \( x = 0.5 \) or \( x = 2 \)
   
   When \( x < 0.5 \), such as \( x = 0 \), L.S. = 0; R.S. = -2;
   
   so \( x = 0 \) does not satisfy the inequality.
   
   When \( 0.5 < x < 2 \), such as \( x = 1 \), L.S. = -3; R.S. = -2;
   
   so \( x = 1 \) does satisfy the inequality.
   
   The solution is: \( 0.5 < x < 2, x \in \mathbb{R} \)
   
   Two possible solutions are: \( x = 1 \) and \( x = 1.5 \)
b) \(-2 \geq -0.5(x - 6)^2\)

Solve: \(-2 = -0.5(x - 6)^2\)
\[(x - 6)^2 = 4\]
\[x - 6 = \pm 2\]
\[x = 4 \text{ or } x = 8\]

When \(x \leq 4\), such as \(x = 0\), L.S. = -2; R.S. = -18;
so \(x = 0\) does satisfy the inequality.

When \(x \geq 8\), such as \(x = 10\), L.S. = -2; R.S. = -8;
so \(x = 10\) does satisfy the inequality.

The solution is: \(x \leq 4 \text{ or } x \geq 8\), \(x \in \mathbb{R}\)

Two possible solutions are: \(x = 1\) and \(x = 20\)

Graph the related functions.
The line has slope 0.5 and \(y\)-intercept -2.
Draw a solid line. Shade the region below the line.

\[\text{Graph of } y = 0.5x - 2\]

The parabola is congruent to \(y = -x^2\) and has vertex \((-3, 4)\).
Draw a broken curve. Shade the region above the curve.

\[\text{Graph of } y > -(x + 3)^2 + 4\]
4. At a school cafeteria, an apple costs 75¢ and a banana costs 50¢. Ava has up to $5 to spend on fruit for herself and her friends.

a) Write an inequality to represent this situation. What are the restrictions on the variables?

Let \( a \) represent the number of apples and \( b \) represent the number of bananas.

An inequality is: \( 75a + 50b \leq 500 \), or \( 3a + 2b \leq 20 \)
Both \( a \) and \( b \) are whole numbers.

b) Determine 2 possible ways that Ava can spend up to $5.

Determine the coordinates of 2 points that satisfy the related function.
When \( a = 0, b = 10 \)
When \( a = 6, b = 1 \)
Join the points with a solid line.
The solution is the points, with whole-number coordinates, on and below the line.
Two ways are: 4 apples, 2 bananas; 2 apples, 6 bananas

5. Solve each system of equations. Use algebra for one system and graphing technology for the other. How did you decide which strategy to use?

a) \( y = 2x^2 + x - 1 \)  
\( x + y = 12 \)
Rearrange equation 1:
\( y = 12 - x \)
Substitute \( y = 12 - x \) in equation 1:
\( 12 - x = 2x^2 + x - 1 \)
\( 2x^2 + 2x - 13 = 0 \)
This equation does not factor, so I use graphing technology. I use algebra when the equation does factor.
Input the equations. To the nearest tenth, the graphs intersect at these points: \((-3.1, 15.1)\) and \((2.1, 9.9)\)
6. The cross section of a pedestrian tunnel under a road is parabolic and is modelled by the equation \( y = -0.3x^2 + 1.8x \), where \( y \) metres is the height of the tunnel at a distance of \( x \) metres measured horizontally from one edge of the path under the tunnel.

In 2010, the tallest living person was about 2.56 m tall. Could he walk through the tunnel without having to bend over?

How could you use an inequality to solve this problem?

Determine the values of \( x \) for which \( y \geq 2.56 \).

Solve: \(-0.3x^2 + 1.8x \geq 2.56\), or \(-0.3x^2 + 1.8x - 2.56 \geq 0\)

Use graphing technology. Input: \( y = -0.3x^2 + 1.8x - 2.56 \)

Determine if there are any values of \( x \) for which \( y \geq 0 \); these values are approximately \( 2.3 \leq x \leq 3.7 \).

So, the tallest living person could walk through the tunnel.