Some factoring formulas:
- **Sum of Cubes**
  \[ a^3 + b^3 = (a + b)(a^2 - ab + b^2) \]
- **Difference of Cubes**
  \[ a^3 - b^3 = (a - b)(a^2 + ab + b^2) \]
- **Difference of Squares**
  \[ a^2 - b^2 = (a + b)(a - b) \]

Some work times formulas:
- Two laborers:
  \[ \frac{1}{x} = \frac{1}{a} + \frac{1}{b} \]
- Three laborers:
  \[ \frac{1}{x} = \frac{1}{a} + \frac{1}{b} + \frac{1}{c} \]

When something moves a distance \( d \) at rate \( r \) for time \( t \), then \( d = rt \).

When simplifying a radical: If your variable could be negative and the index of the radical is even, the result must be placed in absolute value bars.

If \( n \) is a positive integer greater than 1 and \( \sqrt[n]{a} \) is a real number, then \( a^{1/n} = \sqrt[n]{a} \).

If \( m \) and \( n \) are positive integers greater than 1 with \( \frac{m}{n} \) in simplest form, then \( a^{m/n} = \sqrt[n]{a^m} = \left( \sqrt[n]{a} \right)^m \).

As long as \( a^{m/n} \) is a nonzero real number, \( a^{-m/n} = \frac{1}{a^{m/n}} \).

The Product Rule for Radicals: If \( \sqrt[n]{a} \) and \( \sqrt[n]{b} \) are real numbers, then \( \sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab} \).

The Quotient Rule for Radicals: If \( \sqrt[n]{a} \) and \( \sqrt[n]{b} \) are real numbers, and \( \sqrt[n]{b} \) is not zero, then \( \frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}} \).

The distance between two points, \((x_1, y_1)\) and \((x_2, y_2)\), is \( d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \).

The midpoint of the line segment whose endpoints are \((x_1, y_1)\) and \((x_2, y_2)\) is the point with coordinates \( \left( \frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right) \).

The Pythagorean Theorem: If \( a \) and \( b \) are the legs of a right triangle, and \( c \) is its hypotenuse, then \( a^2 + b^2 = c^2 \).

The imaginary unit, written \( i \), is the number whose square is \(-1\). That is, \( i^2 = -1 \) and \( i = \sqrt{-1} \).

If \( a \) is a positive number, then \( \sqrt{-a} = i \cdot \sqrt{a} \).

The Square Root Property: If \( X \) is any algebraic expression, \( c \) is a real number, and \( X^2 = c \), then \( X = \pm \sqrt{c} \).

The Quadratic Formula: If \( ax^2 + bx + c = 0 \) then \( x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \) and its discriminant \( b^2 - 4ac \) tells the quantity and type of solution(s). Given the parabola \( y = f(x) = ax^2 + bx + c \), its vertex is the point \( \left( \frac{-b}{2a}, c - \frac{b^2}{4a} \right) \).