

FORMULAS USEFUL FOR APPLICATIONS

Perimeter of a rectangle. *Perimeter* of a polygon (or any shape on the plane, really) is the total length of its boundary. In particular, perimeter of a rectangle with dimensions a and b is

$$P_{\square} = 2a + 2b$$

and perimeter of a triangle with side lengths a , b , and c is

$$P_{\triangle} = a + b + c$$

Sum of angles in a triangle. The sum of angles in any triangle is 180 degrees.

Distance traveled. The distance d traveled by an object moving at speed v over time t is

$$d = vt$$

Work at constant rate. The amount of work w done at constant rate r (in units of work per unit of time) over time t is

$$w = rt$$

Percent increase and decrease.

If P is the old quantity, N is the new quantity after the increase, and k is the percent increase in decimal form, then

$$N = P + kP = P(1 + k)$$

If P is the old quantity, N is the new quantity after the decrease, and k is the percent decrease in decimal form, then

$$N = P - kP = P(1 - k)$$

Point-slope form. A non-vertical line passing through the point (x_1, y_1) with slope m is a solution set for the equation

$$y - y_1 = m(x - x_1)$$

Quadratic Formula. Given the equation $ax^2 + bx + c = 0$ with $a \neq 0$, the solutions are

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$