All our formulas

Rules for exponents:

$$a^{-n} = \frac{1}{a^n}$$

$$a^m \cdot a^n = a^{m+n}$$

$$\frac{a^m}{a^n} = a^{m-n}$$

$$(a^m)^n = a^{mn}$$

$$(ab)^m = a^m b^m$$

$$\left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}$$

Algebraic expressions:

$$(a+b)^2 = a^2 + 2ab + b^2 \qquad \text{square of a sum}$$

$$(a-b)^2 = a^2 - 2ab + b^2 \qquad \text{square of a difference}$$

$$a^2 - b^2 = (a-b)(a+b) \qquad \text{difference of squares}$$

Rules for roots:

$$\sqrt[n]{ab} = \sqrt[n]{a}\,\sqrt[n]{b}$$

$$\sqrt[n]{\frac{a}{b}} = \frac{\sqrt[n]{a}}{\sqrt[n]{b}}$$

$$\sqrt[n]{a^n} = |a|, \text{ for even } n$$

$$\sqrt[n]{a^n} = a, \text{ for odd } n$$

$$a^{\frac{m}{n}} = \sqrt[n]{a^m} = (\sqrt[n]{a})^m$$

Circles and lines:

$$(x-h)^2 + (y-k)^2 = r^2 \quad \text{circle with center } (h,k) \text{ and radius } r$$

$$m = \frac{y_2 - y_1}{x_2 - x_1} \qquad \text{slope of line through } (x_1, y_1) \text{ and } (x_2, y_2)$$

$$y = mx + b \qquad \text{line with slope } m \text{ and } y\text{-intercept } b$$

$$y - y_1 = m(x - x_1) \qquad \text{line with slope } m \text{ through } (x_1, y_1)$$

Distance and midpoint

$$d = |a - b| \qquad\qquad \text{distance between real numbers } a \text{ and } b$$

$$m = \frac{a+b}{2} \qquad\qquad \text{midpoint of real numbers } a \text{ and } b$$

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \qquad \text{distance between points in the plane } (x_1, y_1) \text{ and } (x_2, y_2)$$

$$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right) \qquad \text{midpoint of points in the plane } (x_1, y_1) \text{ and } (x_2, y_2)$$

Rules for logarithms:

$$\log_a a^x = x \qquad a^{\log_a x} = x$$

$$\log_b M = \frac{\log_a M}{\log_a b}$$

$$\log_a(MN) = \log_a M + \log_a N$$

$$\log_a\left(\frac{M}{N}\right) = \log_a M - \log_a N$$

$$\log_a M^p = p \cdot \log_a M$$

Quadratic formula:

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

Even, odd functions:

If $f(-x) = f(x)$, f is even

If $f(-x) = -f(x)$, f is odd

Compound interest:

$$A = P\left(1 + \frac{r}{n}\right)^{nt}$$