

ALGEBRA I

Are you ready for Algebra I?

Try these problems on your own and then use **Photomath** to check your work and see some important concepts for this school year.

Factorization and Algebraic fractions

$$a^2 - b^2$$

$$\frac{a^2 + 4a + 4}{a^2 - 4}$$

$$4x^2 - 12xy + 9y^2$$

$$\frac{3x^2 + 11x + 6}{x + 3}$$

$$8 + 36y + 54y^2 + 27y^3$$

$$\frac{2x}{x + 2} \cdot \frac{x^2 + 2x}{x + 1}$$

$$p^3 - q^3$$

$$\frac{a^2 - 4}{4a^2} \div \frac{a + 2}{2a + 4}$$

$$x^4 - 2x^3 + 2x - 1$$

$$\frac{a^2 - 4}{2a - 4}$$

$$\frac{a^3 - 1}{1 + \frac{1}{a - a + 1}}$$

Exponentiation and Roots

$$(-7)^2$$

$$10^3 \cdot 10^2$$

$$\sqrt{16} + 3$$

$$(-5)^3$$

$$5^5 : 5^2 : 5$$

$$\sqrt{\frac{4}{25}}$$

$$\left(\frac{2}{3}\right)^2$$

$$3^{13} \cdot \left(\frac{1}{3}\right)^{13}$$

$$\sqrt{15} \cdot \sqrt{3}$$

$$\sqrt{28} : \sqrt{2}$$

$$(5abc)^3$$

$$3^7 \cdot \left(\frac{1}{12}\right)^7 \cdot 2^7$$

$$\frac{1}{\sqrt{2}}$$

$$\frac{7^0 - \frac{1}{4} \cdot \left(\frac{2}{3}\right)^{-3}}{\sqrt[4]{4} - 1}$$

$$\frac{\left(\frac{2}{3}\right)^{-3} \cdot (2.5)^0 + 2^{-4}}{(-0.4)^{-2} - \left(\frac{4}{5}\right)^{-1}}$$

$$\sqrt{\frac{2}{5}} \cdot \sqrt{\frac{5}{27}} \cdot \sqrt{\frac{3}{2}}$$

$$\sqrt{x^2 - 4} \cdot \sqrt{\frac{x - 2}{x + 2}}$$

$$\sqrt{a - 3} \cdot \sqrt{a + 3} \cdot \sqrt{a^2 - 9}$$

Linear equations

$$\frac{2x}{3} = \frac{x}{4}$$

$$\frac{x-2}{2} = \frac{3x-3}{3}$$

$$\frac{x-2}{4} - \frac{x-3}{5} = \frac{x-4}{5}$$

$$\frac{t-5}{2} = 3$$

$$(x-3) : 5 = 2 : 8$$

$$(3-2x) : 3 = (5-3x) : 4$$

$$3.72x + 3.48 \cdot 7 = 3.65(x+7) \quad 2x + 4 \cdot (14-x) + 20 = 60$$

Linear equations with restrictions

$$\frac{x+3}{x+2} - 1 = 0$$

$$\frac{1}{x-1} + \frac{1}{x+1} = \frac{1}{-x+1}$$

$$\frac{x-5}{x-2} : \frac{x+2}{x+3} = 1$$

$$\frac{2}{x} + \frac{2}{x^2-x} = \frac{5}{3x-3}$$

$$\frac{1}{2x-2-x+3-x-1} = 2$$

Linear equations with parameters

Choose for which variable you want to solve the equation

$$3a + 5x = 2$$

$$-4y = 7 - 2x$$

$$-2x = \frac{1}{6}p$$

$$\frac{11}{3}x + 5 = 2\left(p - \frac{x}{5}\right)$$

Linear equations with absolute values

$$|x| + 3 = 5$$

$$|3x - 5| = |2x + 1|$$

$$|x + 2| = -7$$

$$||x - 1| - 2| = 1$$

Quadratic equations

(methods: Square root method, Quadratic formula, Factor method, PQ formula)

$$x^2 - 4 = 0$$

$$(x - 2)^2 = 25$$

$$5x^2 + 48x = 0$$

$$x^2 - 3x - 4 = 0$$

$$(x + 1)(x - 3) = 0$$

$$x^4 + 3x^2 + 2 = 0$$

$$(k - 7)^4 - 13(k - 7)^2 + 36 = 0$$

Systems of linear equations

$$\begin{cases} y = 2x + 1 \\ y = 4x - 2 \end{cases}$$

$$\begin{cases} 3x = 12 \\ 4x - 5y = 6 \end{cases}$$

$$\begin{cases} 3x - y = 21 \\ 2x + y = 4 \end{cases}$$

$$\begin{cases} 2x - 3y = 14 \\ 4x + 5y = 18 \end{cases}$$

$$\begin{cases} x + y + z = 6 \\ 2x + y - z = 1 \\ 3x - y + z = 4 \end{cases}$$

$$\begin{cases} x^2 + 2xy + y^2 - 1 = 0 \\ 2x - y + 5 = 0 \end{cases}$$

Inequalities

$$x + 3 < 0$$

$$2x + 5 > 7x - 3 + 5$$

$$\frac{2}{x+3} > 0$$

$$\frac{2x-1}{3} - \frac{3x+1}{4} < 1 - \frac{x}{12}$$

$$\frac{7x+1}{4x-3} \geq 2$$

$$\frac{x+5}{2x+6} \geq 0$$

$$x^2 - x - 2 \leq 0$$

$$(2x-3)(3x+5) \geq 0$$

$$\frac{2}{x+3} \leq \frac{1}{x-3}$$

$$\frac{x^2 - 4x + 3}{x^2 - 3x + 2} \geq 0$$

Absolute values inequalities

$$|x + 1| \geq 0$$

$$|x - 4| < 9$$

$$|x + 1| + |x + 2| > 5$$

$$|x - 2| \cdot |x - 5| \leq 0$$

$$||x - 1| - 2| > 1$$

$$|x| - |1 - 2x| < -0.5$$

$$|x - |2x - 0.5|| \geq |x - |2x - \frac{1}{2}||$$

Systems of inequalities

$$\begin{cases} x - \frac{1}{2} \geq 0 \\ x - 0.5 \leq 0 \end{cases}$$

$$\begin{cases} x^2 - 4 \leq 0 \\ x > -1 \end{cases}$$

$$\begin{cases} x + 2 > 3 \\ -2x + 5 < -5 \end{cases}$$

$$\begin{cases} \log_9(x - 8) - \frac{3}{2} \leq 0 \\ 0 < 2 - \log_x\left(\frac{1}{9}\right) \end{cases}$$

$$\begin{cases} 2x + x > 3 \\ x + 2 > -3 \\ 5x - 2x > 3 + 2 - x \end{cases}$$

$$\begin{cases} 2x - x > 1 \\ x > \frac{1}{2} + \frac{1}{2} \\ 3x + 2x - 1 > 0 \end{cases}$$