

1. Solve by factoring.

(a) $3x^2 - x - 2 = 0$

(b) $3x^2 + 7x + 4 = 0$

(c) $x^2 - 3x - 18 = 0$

(d) $2x^2 - 15x + 7 = 0$

(e) $6x^2 - 5x + 1 = 0$

(f) $16x^2 - 9 = 0$

(g) $4x^2 + 15x - 4 = 0$

(h) $x^2 - 4x - 21 = 0$

2. Solve the following rational expressions.

(a) $\frac{x - 4}{2} = 0$

(b) $\frac{x + 6}{4} = 1$

(c) $\frac{x + 4}{2} + \frac{x - 1}{2} = \frac{x + 4}{2x}$

(d) $\frac{x - 3}{10} = \frac{4}{x}$

(e) $\frac{3x^2 + 8x + 25}{7} = 4$

3. Solve using key number method.

(a) $\frac{(x + 2)(x - 2)}{x(x + 1)(x - 1)} \leq 0$

(b) $\frac{(x + 3)(x - 1)}{(x + 1)(x - 3)} > 0$

(c) $\frac{-x^2 - 5x + 2}{x + 3} + (2x - 1) < 0$

4. Simplify.

(a) $\left(\frac{x^4y^2}{x^{-3}y}\right)^{-1}$

(b) $\frac{(x^3y)^2}{x^5}$

(c) $\left((x^{1/2}y)^{1/2}\right)^{-1} \cdot xy$

- (d) $81^{1/4} \cdot 8^{2/3}$
(e) $(27^{-1})^{1/3} \cdot 4^{1/2}$
(f) $125^{2/3} \cdot 8^{-2/3}$

5. Rationalize the denominator and simplify.

- (a) $\frac{x-2}{x-\sqrt{2}}$
(b) $\frac{x}{1-\sqrt{3}}$
(c) $\frac{\sqrt{3}}{\sqrt{5}}$
(d) $\frac{7}{\sqrt{7}}$
(e) $\frac{1}{\sqrt[4]{a}}$
(f) $\frac{1}{\sqrt[5]{23^2}}$
(g) $\frac{4}{\sqrt{x+4}-4}$
(h) $\frac{x^2-3}{x+\sqrt{3}}$