
Section 1 – Expanding and Simplifying

Use proper order of operations to expand and simplify the following expressions:

1. $3(5 - 4) - 4(3 + 1)$
2. $6 - 4(1 - 3) + 2(-6)$
3. $(3 + 2)$
4. $(+ 4)$
5. $(3 + 2) - (3 - 2)$
6. $(- 5)$

Section 2 –

Section 3 – Rational Expressions

1. For what values of x is the expression $\frac{x^2 - 4}{x^2 + 2x - 8}$ not defined?
2. Simplify: $\frac{x^2 - 9}{x^2 + 5x + 6}$
3. Combine $\frac{x^2 - 4}{x^2 + 2x - 8} - \frac{x - 2}{x + 4}$ into a single expression.
4. Simplify: $\frac{(x^2 - 4)(x^2 - 9)}{(x^2 + 2x - 8)(x^2 + 5x + 6)}$ Hint: factor the top to start.
5. Simplify: $\frac{\frac{x^2 - 4}{x^2 + 2x - 8}}{\frac{x - 2}{x + 4}}$

Section 4 – Solving Equations

1. Solve the linear equation: $-2x - 5 = 4 + 2(3x - 5)$
2. Solve the following polynomial equations:
 - a) $x^2 - 10x + 24 = 0$
 - b) $x^2 - 8x + 2 = 0$ (Use the Quadratic Formula)
 - c) $4x^2 - 12x - 9 = 0$ (Hint: factor)
 - d) $(x - 3)(x + 6) = 10$
3. Solve the following rational equations:
 - a) $\frac{x^2 - 4}{x^2 + 2x - 8} = 0$
 - b) $\frac{x^2 - 9}{x^2 + 5x + 6} = 0$
 - c) $\frac{x^2 - 4}{x^2 + 2x - 8} - \frac{x - 2}{x + 4} = 0$
 - d) $\frac{\frac{x^2 - 4}{x^2 + 2x - 8}}{\frac{x - 2}{x + 4}} = 0$
4. Solve the following radical equations:
 - a) $\sqrt{7x + 1} - 8 = 0$
 - b) $\sqrt{2x - 4} - \sqrt{21} = 0$

Section 5 – Solving Inequalities

1. Solve the linear inequality: $9 - 4(2 - 3) - 3(5 - 2)$
2. Solve the following inequalities by simplifying to make one side zero (if needed), finding all values for which the expression is zero or undefined and then using test points on a number line. Give your answers using interval notation.

a) $8 + 14 < 2$

b) $(4 -) (- 1) (+ 2) > 0$

c) $\text{————} = 0$

d) $\text{————} = 1$

Section 6 – Exponents and Radicals

Answers

Section 1:

1. $11 \quad 24$

2. $2 \quad + 2$

3. $9 \quad + 12 \quad + 4$

4. $\quad + \quad + 16 + 2 \quad 8$

5. $9 \quad + 18$

6. $\quad 15 \quad + 75 \quad 125$

Section 2:

1. $3 \quad (\quad 5 \quad 2)$

2. $(\quad 9)(\quad + 2)$

3. $5 \quad (\quad 2)(\quad 3)$

4. $(2 \quad 3)(\quad + 4)$

5. $(\quad 3)(\quad + 3)(\quad 4)$

6. $8 \quad (2 \quad 5) \quad (8 \quad 5)$

7. $(\quad + 1) \quad (4 \quad 3) \quad (\quad 33 \quad + 32 \quad 9)$

Section 3:

1. $\quad = 0, 2, \quad 2$

2. $\quad + 6, \quad 3$

3. $\frac{\quad}{(\quad)(\quad)}$

4. $\frac{\quad}{(\quad)}$

5. $\frac{\quad}{(\quad)(\quad)}, \quad 0$

Section 4:

1. $\quad = -$

2. a) $\quad = 12, \quad 2$

b) $\quad = 2.39, 0.28$

c) $\quad = 3, -, \quad -$

d) $\quad = 4, \quad 7$

3. a) $\quad = 1, -$

b) $\quad = 3, \quad 1$

c) $\quad = \quad 5$

d) $\quad = -$

4. a) $\quad = 9$

b) $\quad = 7$

Section 5:

1. 3

2. a) $(2, 6)$

c) $[3, 1] (5,)$

b) $(2, 1) (1, 4)$

d) $(2, 3]$

Section 6:

1. a) $^-$

2. a) $^-$

3. 18.7208

4. $^-$

6. $^-$

8. $\frac{(- -)}{}$

b) $(2 + 1)^-$

b) $^- + ^-$

5. It cannot be simplified any further.

7. $6 (6 + 1)(4 + 1)^-$

9. $==$

c) $2^- + 6$

c) $\frac{+}{+}$