

Review A: Algebra

- 1) Rules of Exponents & Radicals
- 2) Factorization
- 3) Fractions & Rational Expressions
- 4) Completing the Square
- 5) Sets & Intervals
- 6) Inequalities
- 7) Absolute Values

1) Rules of Exponents & Radicals

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2) Factorization



3) Fractions & Rational Expressions

4) Completing the Square

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5) Sets & Intervals



6) Inequalities

7) Absolute Values

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1. Evaluate each expression without using a calculator.

(a) $(-3)^4$

(b) -3^4

Notes:

(c) 3^{-4}

(d) $\frac{5^{23}}{5^{21}}$

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

(f) $16^{-3/4}$

2. Simplify each expression. Write your answer without negative exponents.

(a) $\sqrt{200} - \sqrt{32}$

Notes:

(b) $(3a^3b^3)(4ab^2)^2$

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



3. Expand and simplify.

(a) $3(x + 6) + 4(2x - 5)$

(b) $(x + 3)(4x - 5)$

Notes:

(c) $(\sqrt{a} + \sqrt{b})(\sqrt{a} - \sqrt{b})$

(d) $(2x + 3)^2$

(e) $(x + 2)^3$

4. Factor each expression.

(a) $4x^2 - 25$

(b) $2x^2 + 5x - 12$

Notes:

(c) $x^3 - 3x^2 - 4x + 12$

(d) $x^4 + 27x$

(e) $3x^{3/2} - 9x^{1/2} + 6x^{-1/2}$

(f) $x^3y - 4xy$



5. Simplify the rational expression.

(a) $\frac{x^2 + 3x + 2}{x^2 - x - 2}$

(b) $\frac{2x^2 - x - 1}{x^2 - 9} \cdot \frac{x + 3}{2x + 1}$

Notes:

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

(d) $\frac{\frac{y}{x} - \frac{x}{y}}{\frac{1}{y} - \frac{1}{x}}$

6. Rationalize the expression and simplify.

(a) $\frac{\sqrt{10}}{\sqrt{5} - 2}$

(b) $\frac{\sqrt{4 + h} - 2}{h}$

Notes:



7. Rewrite by completing the square.

(a) $x^2 + x + 1$

(b) $2x^2 - 12x + 11$

Notes:

8. Solve the equation. (Find only the real solutions.)

(a) $x + 5 = 14 - \frac{1}{2}x$

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



8. Solve the equation. (Find only the real solutions.)

(c) $x^2 - x - 12 = 0$

(d) $2x^2 + 4x + 1 = 0$

(e) $x^4 - 3x^2 + 2 = 0$

(f) $3|x - 4| = 10$



8. Solve the equation. (Find only the real solutions.)

(g) $2x(4 - x)^{-1/2} - 3\sqrt{4 - x} = 0$

9. Solve each inequality. Write your answer using interval notation.

(a) $-4 < 5 - 3x \leq 17$

(b) $x^2 < 2x + 8$

Notes:



9. Solve each inequality. Write your answer using interval notation.

(c) $x(x - 1)(x + 2) > 0$

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

(d) $|x - 4| < 3$

10. State whether each equation is true or false.

(a) $(p + q)^2 = p^2 + q^2$

(b) $\sqrt{ab} = \sqrt{a} \sqrt{b}$

(c) $\sqrt{a^2 + b^2} = a + b$

(d) $\frac{1 + TC}{C} = 1 + T$

(e) $\frac{1}{x - y} = \frac{1}{x} - \frac{1}{y}$

(f) $\frac{1/x}{a/x - b/x} = \frac{1}{a - b}$

