



OBJECTIVE 1

Algebra Review / Equations & Inequalities

FACTORING

Factor the following expressions completely:

1. $-3a^4 + 9a^2 - 6a^3$
2. $2v(v - 5) + 3(v - 5)$
3. $k^5 - 7k^3 - 5k^2 + 35$
4. $q^2 - 4q - 45$
5. $20x^2 + 53x + 18$
6. $3t^3 + 15t^2 - 6t - 30$
7. $121h^2 - 144$

FACTORING

Factor the following expressions completely:

1. $-13n^2 - 52$
2. $3p(q^2 + 5) + 7(q^2 + 5)$
3. $3x^2 - xy - 6x + 2y$
4. $n^2 + 20 - 9n$
5. $10u^2 - 19u - 15$
6. $-30n - 4n^2 + 2n^3$
7. $16z^4 - 81$

SUM & DIFFERENCE OF CUBES

Formulae to know:

$$x^3 + y^3 = (x + y)(x^2 - xy + y^2)$$

$$x^3 - y^3 = (x - y)(x^2 + xy + y^2)$$

Factor:

1. $8p^3 - 27$

2. $27q^3 - 125$

3. $n^3 + \frac{8}{27}$

ADDING RATIONAL FUNCTIONS

You must have a common denominator to add or subtract fractions!

Add:

1. $\frac{7}{10x} + \frac{3}{25x^2}$

2. $\frac{10x}{x^2-9} - \frac{5}{x-3}$

3. $\frac{b^2}{4a^2} - \frac{c}{a}$

4. $\frac{5}{n+2} - \frac{n-3}{n^2-4}$

ADDING RATIONAL FUNCTIONS

You must have a common denominator to add or subtract fractions!

Add:

1. $\frac{3}{8x^2} + \frac{5}{2x}$

2. $\frac{3q}{q^2-49} - \frac{3}{2q-14}$

3. $\frac{2}{m-7} - 5$

4. $\frac{y+1}{y^2+y-30} - \frac{2}{y+6}$

5. $\frac{m+2}{m^2-25} - \frac{m+6}{m^2-10m+25}$

SOLVING LINEAR EQUATIONS

Solve for the variable:

1. $8 - (3b + 5) = -5 + 2(b + 1)$

2. $\frac{z-4}{6} - 2 = \frac{z}{2}$

3. $5x - 9 - 2 = -5(x - 2) - 1$

4. $8 - 8(3n + 5) = -5 + 6(1 + n)$

SOLVING LINEAR EQUATIONS

Solve for the variable:

1. $2a + 4(a - 1) = 3 - (2a + 1)$

2. $\frac{x+3}{5} + \frac{x}{3} = 7$

3. $-4(4x + 5) = -6 - 2(8x + 7)$

SOLVING A LINEAR INEQUALITY

Solve the inequality, graph, and write the solution set in interval notation:

1. $2(n + 3) - 4 \leq 5n - 1$

2. $-3(x + 2) > 15$ or $x - 3 \leq -1$

3. $-8.2 < 1.4 - x < -0.9$

SOLVING A LINEAR INEQUALITY

Solve the inequality, graph, and write the solution set in interval notation:

- $-5(x + 2) - 3 < 3x + 11$
- $8 - (6 + 5m) > 9m - (3 - 4m)$
- $-3 \leq 2x + 5 < 7$

INEQUALITIES

As long as the outside temperature is over 45° F and less than 85° F, the city does not issue heating or cooling subsidies for low-income families. What is the corresponding range of Celsius temperatures?

Recall that $F = \frac{9}{5}C + 32$

ABSOLUTE VALUE EQUATIONS & INEQUALITIES

Solve for the variable:

- $-3|x + 5| + 6 = -15$
- $|3x - 5| = |8x + 1|$

Solve for the variable. Write your answer in interval notation:

- $|3b - 11| + 6 \leq 9$
- $|m - 1| > 5$

ABSOLUTE VALUE EQUATIONS & INEQUALITIES

Solve for the variable:

- $-2|y + 3| - 4 = -14$
- $|7 - x| = |4x + 3|$

Solve for the variable. Write your answer in interval notation:

- $|2c + 3| - 5 < 1$
- $|4 - 3z| + 12 < 7$
- $|n + 3| \geq 7$

SOLVING RADICAL EQUATIONS

Solve for the variable:

- $-3\sqrt{3x - 5} = -9$
- $x = \sqrt{3x + 1} + 3$
- $\sqrt{x - 9} + \sqrt{x} = 9$
- $2\sqrt[3]{7 - 3x} - 3 = -7$
- $-2x^{\frac{3}{4}} + 47 = -7$
- $2(x + 5)^{\frac{2}{3}} - 11 = 7$

SOLVING RADICAL EQUATIONS

Solve for the variable:

- $-2\sqrt{4x - 1} = -10$
- $-5 = \sqrt{5x - 1} - x$
- $\sqrt{x + 7} - \sqrt{x} = 1$
- $\frac{\sqrt[3]{2m+3}}{-5} + 2 = 3$
- $x^{\frac{3}{5}} + 17 = 9$
- $-3(x - 2)^{\frac{4}{5}} + 29 = -19$
