Honors Algebra 2

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Extra Practice Problems

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Contents

Chapter 1

Equations and Inequalities

Equations

Solve each equation. Round decimal answers to 2 decimal places.

1. $-7x + 5 = -10x + 11$

2. $\frac{2}{3}x - 10 = \frac{5}{8}$

3. $-0.2x - 3(x + 1.4) = -5.2x + 1$

4. $1.3 + 2.1(6.3x + 12) = -19.7$

5. $\frac{1}{4}x + \frac{3}{7} = -2\left(x + \frac{3}{8}\right)$

Solve each for the variable indicated.

6. $F = ma$; for a

7. $PV = nRT$; for n

8. $m = \frac{y_2 - y_1}{x_2 - x_1}$; for y_2

9. $m = \frac{y_2 - y_1}{x_2 - x_1}$; for y_1

10. $v = v_0 + gt$; for t

11. $S = 180(n - 2)$; for n

Inequalities

Solve each inequality. Graph your answers on a number line.

1. $2(x + 2) \leq 4x - 2(x - 1)$

2. $-3.2x - 5(x - 1.5) > 7.7 + 1.8x$

1.1 Answer Key

Equations

1. $x = 2$

2. $x = \frac{255}{16}$

3. $x = 2.6$

4. $x = -3.49$

5. $x = -\frac{11}{21}$

6. $a = \frac{F}{m}$

7. $n = \frac{PV}{RT}$

8. $y_2 = m(x_2 - x_1) + y_1$

9. $y_1 = y_2 - m(x_2 - x_1)$
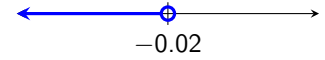
10. $t = \frac{v - v_0}{g}$

11. $n = \frac{S}{180} + 2$

Inequalities

1. $\emptyset$
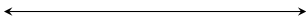
2. $x < -0.02$

-0.02

Chapter 2

Compound Inequalities

Solve each. Graph your answers on a number line.

1. $-3 < x - 8 \le 12$

2. $7 \le 2x - 5 < 18$

3. $x + 8 < 10$ or $5x - 9 \ge 26$

4. $x - 1.5 > 8$ or $-x + 2 > 9$

5. $4 \le x + 7 < 9$

6. $-2 < 6x + 10 \le 5$

7. $3x > 9$ or $-5x > 25$

8. $8x + 12 \le 20$ or $x + 12 > 9$

9. $-8 \le 3x + 7 < 40$

10. $-5x + 9 \ge 12$ or $2x + 6 > 5$

11. $3x - 1 < x + 5$ or $-x \ge 5 + 7x$

Answer Key

1. $5 < x \leq 20$

2. $6 \leq x < \frac{23}{2}$

3. $x < 2$ or $x \geq 7$

4. $x < -7$ or $x > \frac{19}{2}$

5. $-3 \leq x < 2$

6. $-2 < x \leq -\frac{5}{6}$

7. $x < -5$ or $x > 3$
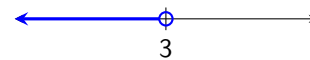
9. $-5 \leq x < 11$

8. $\mathbb{R}$

10. $x \leq -\frac{3}{5}$ or $x > -\frac{1}{2}$

12. $x < 3$

11.

Chapter 3

Absolute Value Equations and Inequalities

3.1   Absolute Value Equations

Solve each of the following.

1. $|2x| = 10$
2. $|3x - 7| = 8$
3. $|5x + 1| = -4$
4. $|x + 7| = 9$
5. $|8x + 16| = -24$
6. $|-x - 4| = -3$
7. $\left|\frac{1}{2}x + 2\right| = x - 3$

3.2   Absolute Value Inequaltiies

Solve each. Graph your answers on a number line.

1. $|x - 9| < 10$
2. $|-x + 1| \geq 7$
3. $|x + 8| < -1$
4. $|6x - 18| < 42$
5. $|-2x + 1| \geq 9$
6. $|5x + 2| < 3x$
7. $|3x + 2| > 1$
8. $|2x - 1| \leq 7$

Answer Key

Absolute Value Equations

1. $x = \pm 5$

2. $x = -\frac{1}{3}$ or $x = 5$

3. $\emptyset$

4. $x = 2$ or $x = -16$

5. $\emptyset$

6. $\emptyset$

7. $x = 10$

Absolute Value Inequalities

1. $-1 < x < 19$

2. $x \leq -6$ or $x \geq 8$

3. $\emptyset$

4. $-4 < x < 10$

5. $x \leq -4$ or $x \geq 5$

6. $\emptyset$
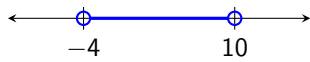
7. $x < -1$ or $x > \frac{1}{3}$

8. $-3 \leq x \leq 4$

9.

Chapter 4

Factoring Techniques

Factor each completely.

1. $x^2 + 2x - 15$

2. $a^2 - 15a + 56$

3. $8x^2 + 10x + 3$

4. $w^2 + w - 12$

5. $5b^2 - 9b - 2$

6. $12x^2 + 40x - 7$

7. $4x^2 - 4x - 24$

8. $18t^2 - 9t - 5$

9. $6a^2 + 23a + 21$

10. $x^2 - 12x + 36$

11. $9x^2 - 1$

12. $4x^2 + 4x + 1$

Answer Key

1. $(x+5)(x-3)$
2. $(a-8)(a-7)$
3. $(4x+3)(2x+1)$
4. $(w+4)(w-3)$
5. $(b-2)(5b+1)$
6. $(2x+7)(6x-1)$
7. $4(x-3)(x+2)$
8. $(3t+1)(6t-5)$
9. $(3a+7)(2a+3)$
10. $(x-6)^2$
11. $(3x-1)(3x+1)$
12. $(2x+1)^2$

Chapter 5

The Quadratic Formula

Solve each. Exact answers only.

1. $x^2 - 6x = -2$

2. $4x^2 + 7x - 1 = 0$

3. $8x^2 + 4x = 3$

4. $5x^2 + 6x - 2 = 3x^2 + 10$

Answer Key

1. $x = 3 \pm \sqrt{7}$

2. $x = \frac{-7 \pm \sqrt{65}}{8}$

3. $x = \frac{-1 \pm \sqrt{7}}{4}$

4. $x = \frac{-3 \pm \sqrt{33}}{2}$

Chapter 6

Complex Numbers

Simplify each.

1. $(4 - 7i) + (-2 + 6i)$

2. $(2 - 4i) - (2 - 3i)$

3. $6 - (8 + 4i)$

4. $3(-2 + 7i)$

5. $(2 + 3i)(-2 - 5i)$

6. $(4 + 6i)(4 - 6i)$

7. $\frac{3+i}{2-i}$

Solve each. Exact answers only.

8. $3x^2 - 7x + 6 = 0$

Answer Key

1. $2 - i$

2. $-i$

3. $-2 - 4i$

4. $-6 + 21i$

5. $11 - 16i$

6. 52

7. $1 + i$

8. $x = \frac{7 \pm i\sqrt{23}}{6}$

Chapter 7

Graphs of Quadratic Expressions

Identify the vertex and axis of symmetry for each.

1. $y = 5x^2 - 15x + 7$

2. $y = x^2 + 8x - 1$

3. $y = \frac{1}{4}(x + 3)^2 + 1$

7.1 Answer Key

1. Vertex: $\left(\frac{3}{2}, -\frac{17}{4}\right)$;   Axis of Symmetry: $x = \frac{3}{2}$

2. Vertex: $(-4, -17)$;   Axis of Symmetry: $x = -4$

3. Vertex: $(-3, 1)$;   Axis of Symmetry: $x = -3$