

**Summer Math Review 2017**  
*For Section 9 College Prep*

- *You should not use a calculator for this work.*
- *Work on a separate sheet of paper.*
- *Show all work.*

Section 1 – Operations with Integers

Simplify each of the following.

1.  $-3 + (-5)$

2.  $23 + (-6)$

3.  $-104 + 94$

4.  $-13 + 23 + (-2)$

5.  $-1000 + (-1010) + 2000$

6.  $-57 + (-16) + 46 + (-16) + 5$

## Section 2 – Fractions Practice

Simplify each of the following. Reduce all fractional answers as far as possible.

1.  $\frac{3}{4} + \frac{2}{3}$

2.  $1\frac{3}{7} + 3\frac{3}{5}$

3.  $2\frac{5}{9} - \frac{5}{6}$

4.  $\frac{5}{8} - 1\frac{1}{2}$

5.  $\frac{3}{8} \cdot \frac{4}{5}$

6.  $2\frac{3}{4} \cdot 3\frac{1}{5}$

7.  $\frac{4}{15} \div \frac{2}{5}$

8.  $\frac{\frac{1-5}{3-6}}{\frac{3}{4}}$

### Section 3 – Order of Operations

Simplify:

1.  $4 + 6 \cdot 2 - 5$

2.  $25 - 10 \div 2$

3.  $3 + (5 - 2) + 6^2$

4.  $\frac{4^2 - 20 \div 5}{1 - 5 + 7}$

5.  $3[2 + (5 + 2^3)]$

6.  $(3^2 - 4^2)^2$

Substitute and simplify.

7.  $8x^2 + x - 9$  for  $x = 2$

8.  $14x - (2y + z)$  for  $x = 3, y = 4, z = 5$

9.  $\frac{21xy}{x+y}$  for  $x = 3, y = 4$

10.  $2y^2 - x - 1$  for  $x = 2, y = 4$

#### Section 4 – Solving equations

Solve each of the following equations for the given variable.

1.  $4x + 10 = 6x - 2$

2.  $3(y - 2) = 10$

3.  $4k + 3(k - 6) = 2k$

4.  $\frac{1}{3}d + 8 = \frac{1}{6}d - 2$

5.  $-4f + 25 = 5(f + 5)$

6.  $3r - 5 + 5(r - 1) = 5r - 5$

7.  $8w + 12 - 6w = 4(w + 3) - 2w$

8.  $2n^2 + 7n - 5 = 2n^2 - 3n + 10$

## Section 5 – Rules of Exponents

Simplify each of the following as a single expression with no negative exponents:

1.  $x^2 \cdot x^3$

2.  $\frac{x^2}{x^3}$

3.  $(x^2)^3$

4.  $\frac{6x^5y^6}{2x^3y^9}$

5.  $x^{1/2} \cdot x^{2/3}$

6.  $\left(\frac{2x^2}{y^3}\right)^{-2}$

Section 6 – Simplifying expressions with polynomials

Find the sum or difference.

1.  $3x^2 - 10x + 26$   
 $+ x^2 + 12x - 10$

2.  $(5r^2 - 4r + 32) + (-6r^2 - 17r + 2)$

3.  $7m^2 - 15m + 34 - (2m^2 - 14m - 20)$

4.  $(-16g^3 + 7g - 22) - (4g^2 - 9g + 3)$

5.  $(31m - 5) - (-24m - 9) + (5m - 10)$

6.  $(-b^3 - b) - (b^3 + b^2) - (-b^2 + b)$

Find the product.

7.  $-3(-2x - 4)$

8.  $7c(2c^2 + 4c - 9)$

9.  $(w + 5)(w - 8)$

10.  $(6a - 3b)(4a + 12b)$

Section 7 – Simplifying Radicals

Simplify:

1.  $\sqrt{8}$

2.  $\sqrt{10} \cdot \sqrt{15}$

3.  $\frac{\sqrt{126}}{\sqrt{7}}$

4.  $\sqrt[3]{8x^6y^9}$

5.  $\sqrt{45} + \sqrt{20}$

Section 8 – Factoring

Factor completely:

1.  $x^2 + 7x + 12$

2.  $c^2 + 8c + 12$

3.  $z^2 - 6z + 5$

4.  $k^2 + 6k - 40$

5.  $a^2 - 12a + 36$

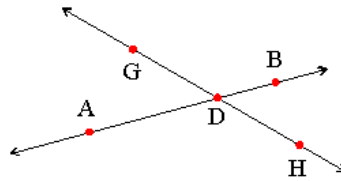
6.  $d^2 - 9$

7.  $100f^2 - 49$



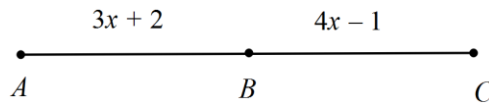
Section 9 – Geometry

1. In the diagram:



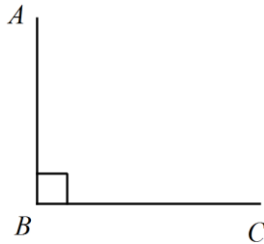
- Give 2 different notations for the line that includes point A.
- Are the lines  $\overleftrightarrow{GD}$  and  $\overleftrightarrow{GH}$  the same line? Why?
- Are the rays  $\overrightarrow{GD}$  and  $\overrightarrow{GH}$  the same ray? Why?
- Are the rays  $\overrightarrow{GD}$  and  $\overrightarrow{DG}$  the same ray? Why?
- State an angle in the diagram that appears to be acute.
- State an angle in the diagram that appears to be obtuse.
- State an angle in the diagram that appears to be straight.
- What are the sides of angle  $\angle ADG$ ?
- State three points that are collinear.

2. In the diagram:



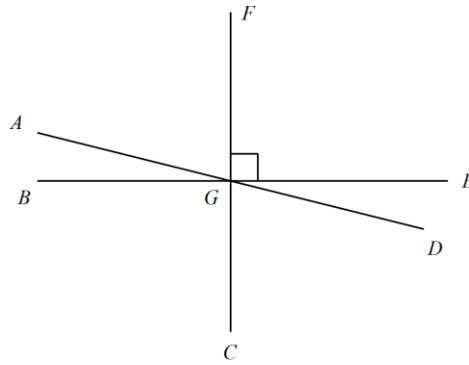
B is the midpoint of  $\overline{AC}$ . Find the length  $AC$ .

3. In the diagram:

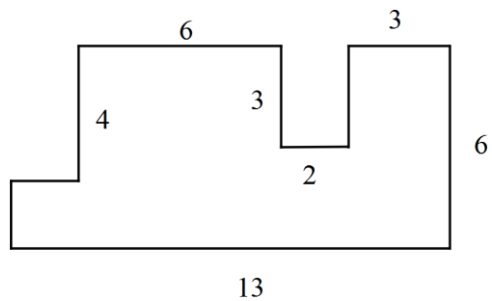


- segments  $\overline{AB}$  and  $\overline{BC}$  are \_\_\_\_\_.
- the measure of  $\angle ABC$  is \_\_\_\_\_.

4. In the diagram:



- a. state an angle other than  $\angle FGE$  that is right.
  - b. state two angles that are adjacent.
  - c. state two angles that are vertical.
  - d. state two angles that are complementary.
  - e. state two angles that are supplementary.
  - f. state two angles that are congruent but are not right angles.
5. A rectangle has sides of length 4cm and 7cm.
- a. What is its perimeter?
  - b. What is its area?
6. A circle has a radius of 5in.
- a. What is its circumference?
  - b. What is its area?
7. Find the area of the figure. Assume all angles are right.



8. Find the volume of a rectangular box with dimensions 2 ft, 4 ft, and 5 ft.
9. Find the surface area of a rectangular box with dimensions 2 ft, 4 ft, and 5 ft.
10. The area of a triangle is  $24 \text{ cm}^2$ . Find its height if its base measures 6 cm.