

9th Grade Assignments – Week #2

Individual Work

- Choose the best problems for you to work on from **Algebra Basics – Problem Sets #2-4**.

Group Assignment:

Special Note: Again, given that you are in 9th grade, I am giving you a good amount of freedom to decide what to do with your group work time. In addition to (or instead of) the below puzzles, you may wish to spend part of your group time working on your "individual assignment".

for Tuesday or Thursday

- (1) There are two hourglasses. One runs for 7 minutes, and the other runs for 4 minutes. How is it possible to time a 9-minute interval? (You can't put marks on the hourglass.)
- (2) There is a group of teenagers. The product of their ages is 737,100. Find the number of teenagers in the group and the age of each one. (You can use a calculator, but you still need to think!)
- (3) Paths on a Globe.
From which places on the earth can you travel 1 mile south, 1 mile east, and then 1 mile north, thereby ending up back at your origin? How many total such places are there? (Hint: It is more than one.)

Algebra Basics

Problem Set #1

Section A

Signed Numbers

Simplify.

- 1) $-9 + 25$
- 2) $-9 - 25$
- 3) $23 - 31$
- 4) $-31 + 23$
- 5) $(5)(7)$
- 6) $(5)(-7)$
- 7) $-3 + 9$
- 8) $(-3)(+9)$
- 9) $3 - 9$
- 10) $(-3)(-9)$
- 11) $-3 - 9$
- 12) $(-15) \div (-5)$
- 13) $(15) \div (-5)$
- 14) $\frac{15}{-5}$
- 15) $3 - -8$
- 16) $7 - +11$
- 17) $-4 - -9$
- 18) $-7 - (-2 - 10)$

Expressions

Simplify.

- 19) $5X + 9X$
- 20) $2A + 8X - 8A$
- 21) $2 + 5X - 7$
- 22) $-7 - X - 12 - X - 3Y$
- 23) $3X - 21 + X$
- 24) $-5X + 1 - 5X - 1$
- 25) $X - 2Y - 7X + 16$

Equations

Solve each equation by getting X alone. Use the method of "moving terms" instead of showing how sides balance.

- 26) $2X + 6 = 7X - 4$
- 27) $8X + 3 = 4X - 11$
- 28) $4X - 3 + 10X = 7 + 2X - 58$

Section B

Solve.

- 29) $5X - 7X + 13 - 2X = -10 - 3 + X + 3$
- 30) $-9 - X + 4 + 12X - 6 - 3X - 12X = 1$
- 31) $X + 2X + 3X + 4 + 5X - 20X = 4$
- 32) $3(X + 5) = 8 - (X + 2)$

Problem Set #2

Section A

Signed Numbers

Simplify.

- 1) $(-4)(-7)$
- 2) $-4 - 7$
- 3) $(-5)(8)$
- 4) $\frac{-30}{-3}$
- 5) $\frac{30}{-3}$
- 6) $\frac{-30}{3}$
- 7) $15 + -9$
- 8) $-7 - -5$
- 9) $-2 - +9 - -7 - +4$

Order of Operations

Simplify.

- 10) $5 + 4 \cdot 2$
- 11) $(5 + 4) \cdot 2$
- 12) $7 - 5 \cdot 3$
- 13) $(7 - 5) \cdot 3$
- 14) $10 \cdot 5^2$
- 15) $(10 \cdot 5)^2$
- 16) $5 + 20 \div 4$
- 17) $18 \div 12 \div 2 - 2 \cdot 4$

Equations Solve.

- 18) a) $-3X = 24$ b) $-3X = -24$
- 19) a) $X + 4 = -18$ b) $X - 4 = 18$
- 20) a) $X \div 3 = 21$ b) $\frac{X}{3} = 21$ c) $\frac{1}{3}X = 21$
- 21) a) $-36X = -4$ b) $-4X = -36$
- 22) a) $\frac{3}{7}X = \frac{4}{5}$ b) $\frac{4}{5}X = \frac{3}{7}$
- 23) a) $-\frac{5}{7}X = \frac{5}{14}$ b) $X - \frac{5}{7} = \frac{5}{14}$

Section B

Solve.

- 24) $7X - 3 + 9X - 12 - 13X + 5 - X + 12 = 0$
- 25) $6 + 2(3X - 7) + 3X = 8 - 3(X - 4) - X + 5$
- 26) $\frac{1}{4}X - 3X + 3 = \frac{2}{5}X - 6$

Problem Set #3

Section A

Simplify.

- 1) $X + X$
- 2) $X \cdot X$
- 3) $X \cdot X \cdot X \cdot X \cdot X$
- 4) $X \div X$
- 5) $5X - B + X - B - Y$
- 6) $-3X - 7 - X + 9$
- 7) $-8 - 2 + 6 - 7 + 4$
- 8) $-5 + -9X - +7 - -2X$
- 9) $(-4)^2$
- 10) $(-4)^3$
- 11) $(-4)^4$
- 12) $30 \div 8 \div 4$
- 13) $10 - 8 \cdot 10^3 \div 4 \cdot 2$
- 14) Which fraction isn't equal to the others?
(a) $\frac{3}{-7}$ (b) $\frac{-3}{7}$ (c) $\frac{-3}{-7}$ (d) $-\frac{3}{7}$

Evaluate each expression given

$$X = -2; Y = -10; Z = -5$$

- 15) $X^2 + 2Y - 3Z$
- 16) $Y^2 - 5Z$
- 17) $-Y^2 - 5Z$
- 18) $4X - 2YZ + 3Z^2$

Solve.

- 19) a) $-X - 5 = -1$
b) $-6X + 3 = -15X$
- 20) $36X + 7 = 12X - 5$
- 21) a) $\frac{X}{-5} = -30$
b) $\frac{3}{5}X = -9$
- 22) $3(X + 2) + 5 = 1 - (X + 1)$

Section B

Solve.

- 23) a) $-4X = -\frac{2}{5}$
b) $\frac{8}{9} = \frac{12}{X}$
- 24) a) $\frac{8X}{15} = -\frac{12}{5}$
b) $\frac{-2}{X} = \frac{3}{X-5}$

- 25) $4X - 8 - 10 - 6X = -7 - 3X - 3 + 22$
- 26) $4X + 4 + 2(X - 3) = 10 - 6(3X + 4) + 5 - (4X - 7)$
- 27) $1\frac{1}{3}X - 3\frac{1}{4} = 5X + 4\frac{1}{2}$

Problem Set #4

Section A

Simplify.

- 1) $12 \div 3 + 6 \cdot 2$
- 2) $8 + 10 \div 6 + 2 \cdot 2^2$
- 3) $9 - 7(9 - 5 \cdot 2)^2 - 5$
- 4) $8(537 - 530) - 8$
- 5) $8(2X - 4) - 3$

Solve.

- 12) a) $-6X = -42$ b) $-28X = 4$
- 13) a) $-5 + X = -7\frac{1}{7}$ b) $-5X = -7\frac{1}{7}$
- 14) a) $8X + 3 = 12X - 13$ b) $5\frac{1}{2}X + 3 = 7 - \frac{7}{2}X$
- 15) a) $5(X - 3) = -3(X - 1)$ b) $4(X + 3) - 1 = 1 - (2X + 3)$

Section B

Solve.

- 16) a) $\frac{-2}{5} = \frac{-3}{5X}$ b) $\frac{3X}{7} = \frac{-3}{8}$ c) $-1\frac{3}{5}X = \frac{4}{7}$
- 17) a) $\frac{-3}{X-5} = \frac{2}{3X+2}$ b) $2X - \frac{3}{4} = \frac{3}{4}X + 3$
- 18) $7 - 3(2X - 7) + 5X = 5X - 20 + 4(X - 8) + 8 - 2X$
- 19) $-\frac{1}{3}X + \frac{2}{3} - \frac{1}{4}X = \frac{7}{10} + \frac{5}{6}X - \frac{2}{5}$

Evaluate each expression given $X = -1$; $Y = 3$; $Z = 0$.

- 6) $Z^3 - 4XZ^2$
- 7) $7X^2Y^3 - 8X^3$
- 8) $X^9 + 23Z^5 - 6(Z - 10)$

Unusual solutions.

Solve.

- 9) $8 - 2X = 7X - 6 - 9X$
- 10) $8 - 2X = 5 + 3X + 3$
- 11) $8 - 2X - 5 = -X + 3 - X$