

8th Grade Assignment – Week #27

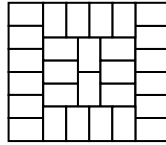
Important Note: In this *Algebra* unit you should not use your calculator (except in rare circumstances). Also, in general with algebra, fractions are preferred over decimals.

Group Assignments:

For Tuesday and Thursday:

- If needed, help each other out with answer any questions from the *Proportions and Dimensional Analysis – Practice Test* (see last week’s assignment).
- Look at *Algebra Practice Sheet #1* and *Practice Sheet #2*, and choose the more difficult ones to do in your group work. (The rest of the problems should be done individually.)
- *Puzzle!* Brick Laying

Identical bricks are laid to form a small patio as shown. Find the dimensions of a single brick if the whole patio has an area of 2058 square inches.



Individual Work

- Test! Before the end of this week, take the test found at the end of this document.
- Whatever problems you didn’t complete in your group from *Algebra Practice Sheet #1* and *Practice Sheet #2*, you should do on your own.

Algebra – Practice Sheet #1

Showing work: Throughout this unit, you should show each of the steps when solving an equation, even if you can do the problem easily in your head. Although it may not seem necessary, this will help you to develop the skills needed later for complex problems.

Formulas

1) *Galileo's Law of Falling Bodies* is: $D = 16T^2$, where D is the number of feet an object falls (neglecting air resistance) after being dropped for T seconds. Calculate the distance that an object falls after being dropped...

a) For 4 seconds.

b) For $2\frac{1}{2}$ seconds.

2) The *temperature conversion formulas* are:

$$C = \frac{5}{9} \cdot (F - 32)$$

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

Use these formulas to...

a) Convert 10°C to $^{\circ}\text{F}$.

b) Convert -15°C to $^{\circ}\text{F}$.

c) Convert 113°F to $^{\circ}\text{C}$.

d) Convert 23°F to $^{\circ}\text{C}$.

Signed Numbers

Simplify.

3) $-9 + 15$

4) $-9 - 15$

5) $28 - 32$

6) $-32 + 28$

7) $(3)(7)$

8) $(3)(-7)$

9) $3 - 7$

10) $(-3)(+7)$

11) $-3 + 7$

12) $(-3)(-7)$

13) $-3 - 7$

14) $(-15) \div (-5)$

15) $(15) \div (-5)$

16) $\frac{15}{-5}$

17) $9 - -4$

18) $7 - +11$

19) $-3 - -9$

20) $-7 - (-2 - 8)$

Expressions

Simplify by combining like terms.

21) $5X + 7X$

22) $3A + 3X - 8A$

23) $2 + 5X - 7$

24) $3Y - 4 + X - 12 - X + Y$

25) $3X - 73 + 10X$

26) $-5X + 1 - 5X - 5$

27) $X - Y - 3X + 6$

Equations

Solve each equation by getting X alone. Show what is done to each side.

Example: $X + 12 = 7$

$$\begin{array}{r} X + 12 = 7 \\ -12 \quad -12 \\ \hline X = -5 \end{array}$$

28) $X - 1 = -7$

29) $5X = 35$

30) $35X = 5$

31) $X \div 4 = 12$

32) $X + 5 = -3$

33) $X \div 3 = -12$

34) $-2X = 14$

35) $7X - 3 = 4X + 18$

Algebra – Practice Sheet #2

Formulas

1) Convert 59°F to $^{\circ}\text{C}$.

2) Convert -5°C to $^{\circ}\text{F}$.

3) Convert 70°F to $^{\circ}\text{C}$.

4) Convert 42°C to $^{\circ}\text{F}$.

5) Calculate the distance that an object falls after being dropped for $1\frac{1}{2}$ seconds.

Signed Numbers

Simplify.

6) $-2 + 7$

7) $-5 + 3$

8) $-5 - 3$

9) $(24) \div (-2)$

10) $(-24) \div (2)$

11) $\frac{-24}{2}$

12) $(-24) \div (-2)$

13) $\frac{-24}{-2}$

14) $13 - -8$

15) $7 - +2$

16) $7 + -2$

17) $-6 - -2 + -3 - +4$

Expressions

Simplify by combining like terms.

18) $X - 7 - 3X - 8$

19) $-3X - 7 + X - 9$

20) $-X - 2 - 6X + 8$

21) $-6 - 4 + 2 - 9 + 4$

22) $-2 + -9 - -4 - +1$

Order of Operations

Simplify.

23) $5 + 3 \cdot 2$

24) $(5 + 3) \cdot 2$

25) $7 - 5 \cdot 3$

26) $(7 - 5) \cdot 3$

27) $4 \cdot 5^2$

28) $(4 \cdot 5)^2$

29) $8 + 20 \div 4$

Distributive Property

Simplify.

30) $4(3X - 5)$

31) $3(X + 7)$

32) $-6(7X + 4)$

33) $-3(X - 4)$

Equations

Solve each equation by getting X alone. Show what is done to each side.

34) $X - 8 = 12$

35) $8X = 40$

36) $8X = -40$

37) $-8X = -40$

38) $-8 + X = 40$

39) $3X - 1 = 5X + 9$

40) $7X + 5 = 9X + 17$

41) $5X - 7 = -X + 3$

Proportions & Dimensional Analysis – Test

Note:

- You must show what goes into your calculator.
- Each problem is worth 4 points unless otherwise indicated.

- 1) Jeff biked 32 miles in one hour and 15 minutes. What was his average speed?
- 2) Jill's car has a fuel efficiency of 47mpg on the highway. At that rate, how much gasoline does it take to go 800 miles?
- 3) It takes Mr. Smith 45 minutes to grade 4 tests. How long would it take him to grade 30 tests?
- 4) What is the weight of 3.8 ft^3 of water (in pounds)?
- 5) What is the density (in lbs/ft^3) of a rock that weighs 29.3 lbs and has a volume of 210 in^3 ?
- 6) What is the volume (in cm^3) of an 8-kg block of iron?

7) Unit Conversions (2 points each)

- a) $24 \text{ g} \approx$ _____ oz
- b) $200 \text{ mL} \approx$ _____ fl.oz.
- c) $3140 \text{ km} \approx$ _____ mi
- d) $1\frac{3}{4} \text{ ft} \approx$ _____ cm
- e) $17.3 \text{ L} \approx$ _____ pt
- f) $4,000,000 \text{ cm}^3 \approx$ _____ ft^3

8) Use the chain rule (and show your work!) for each problem. You are NOT allowed to use the conversion table for these problems. The only facts you need to know and use are:

- $1000\text{m} = 1\text{km}$
- $3600\text{s} = 1\text{h}$ (s = second; h = hour)
- $12 \text{ in} = 1 \text{ ft}$
- $16 \text{ oz} = 1 \text{ lb.}$

(2 points each)

- a) $10 \frac{\text{m}}{\text{s}} =$ _____ $\frac{\text{km}}{\text{h}}$
- b) $253 \frac{\text{lb}}{\text{ft}^3} =$ _____ $\frac{\text{oz}}{\text{in}^3}$

- 9) The island of Madagascar is shown on the map below. The scale of the map is 1:24,000,000. What is the length of the island?



- 10) The actual distance between Wuhan and Shanghai, in China, is about 1020km. Give both the verbal and the fractional scale of the map shown below.



- 11) The exchange rate for the Indian Rupee is $0.0231 \frac{\text{dollars}}{\text{rupee}}$. (2 points each)
- a) How many rupees is one dollar worth?
- b) How many dollars is 3000 rupees worth?

- 12) *Extra Credit* (Do only if you have extra time!)

In Paris, France, Henri owns La Belle Concrete Ltd. He charges 55 euros per cubic meter to do a job. (1 point each)

- a) How much would he charge to pour the concrete needed for a parking area measuring 80m by 30m if the concrete is to be 30cm deep?
- b) Convert his rate ($55 \frac{\text{euro}}{\text{m}^3}$) to dollars per ft^3 . (The exchange rate is $1.2832 \frac{\text{dollars}}{\text{euro}}$.)