

**Rational vs. Irrational**

1. Circle all rational numbers:  $(-\sqrt{16})$ ,  $\sqrt{12}$ ,  $(4.2)$ ,  $(4.33)$ ,  $-4.257\dots$ ,  $\pi$ ,  $(\frac{1}{2})$ ,  $(6)$
2. Determine if the statement is always, sometimes, or never true.
- a.) The sum of two rational numbers is rational. **A**
- b.) The sum of a rational number and an irrational number is irrational. **A**
- c.) The sum of two irrational numbers is irrational. **S**
- d.) The product of two rational numbers is always rational. **A**
- e.) The product of a non-zero rational and irrational number is irrational. **A**
- f.) The product of two irrational numbers is irrational. **S**

**Simplifying Radicals**

3.  $\sqrt{50}$

$5\sqrt{2}$

4.  $3\sqrt{20}$

$3 \cdot 2\sqrt{5}$   
 $6\sqrt{5}$

5.  $2\sqrt{196}$

$2 \cdot 14$   
 $28$

6.  $\sqrt{108}$

$6\sqrt{3}$

7.  $-7\sqrt{54x^{11}}$

$-21 \times \sqrt[5]{6x}$

8.  $6\sqrt{75mp^2q^3}$

$6 \cdot 5pq \cdot \sqrt{3mq}$   
 $30pq\sqrt{3mq}$

9.  $\sqrt{16x^4y}$

$4x^2\sqrt{y}$

10.  $-3\sqrt{24ab^9c^{12}}$

$-3 \cdot 2b^4c^6\sqrt{6ab}$   
 $-6b^4c^6\sqrt{6ab}$

11.  $-\sqrt{9}$

$-3$

**Adding and Subtracting Radical**

12.  $7\sqrt{5} - 4\sqrt{5}$

$3\sqrt{5}$

13.  $7\sqrt{20} + \sqrt{5}$

$7 \cdot 2\sqrt{5} + \sqrt{5}$   
 $14\sqrt{5} + \sqrt{5}$   
 $15\sqrt{5}$

14.  $\sqrt{54} + 2\sqrt{27} - 5\sqrt{18}$

$3\sqrt{6} + 6\sqrt{3} - 15\sqrt{2}$

15.  $-3\sqrt{45} + 2\sqrt{12} + 3\sqrt{6} - 2\sqrt{20}$

$-9\sqrt{5} + 4\sqrt{3} + 3\sqrt{6} - 4\sqrt{5}$   
 $-13\sqrt{5} + 4\sqrt{3} + 3\sqrt{6}$

**Multiplying Radicals**

16.  $\sqrt{5} \cdot \sqrt{2}$

$\sqrt{10}$

17.  $3\sqrt{10} \cdot 4\sqrt{2}$

$12\sqrt{20}$   
 $24\sqrt{5}$

18.  $(3\sqrt{8})^2$

$(3\sqrt{8})(3\sqrt{8})$   
 $9\sqrt{64} = 9 \cdot 8$   
 $72$

19.  $\sqrt{5}(3\sqrt{5} - 4\sqrt{3})$

$3\sqrt{25} - 4\sqrt{15}$   
 $3 \cdot 5 - 4\sqrt{15}$   
 $15 - 4\sqrt{15}$

**Dimensional Analysis (Use Measurement Conversion Chart. Round to nearest hundredth, if applicable)**

20. Convert 2 miles to inches

$$\frac{2 \text{ miles}}{1} \cdot \frac{5280 \text{ ft}}{1 \text{ mile}} = 10,560 \text{ in}$$

21. Convert 1,000 feet/second to miles per hour

$$\frac{1000 \text{ ft}}{1 \text{ sec}} \cdot \frac{1 \text{ mile}}{5280 \text{ ft}} \cdot \frac{60 \text{ sec}}{1 \text{ min}} \cdot \frac{60 \text{ min}}{1 \text{ hr}} = 681.81 \text{ mph}$$

22. How many fluid ounces are in 6.5 pints?

X

16 ounce = 1 pound  
 1 mile = 5280 ft  
 3 ft = 1 yard  
 1 ounce = 28 grams  
 1 liter = 1.05 qts  
 1 kg = 2.2 lbs  
 1 ton = 2000 lbs

23. Johnny bowls with a 16-pound ball. How many grams is that?

$$\frac{16 \text{ lb}}{1} \cdot \frac{16 \text{ oz}}{1 \text{ lb}} \cdot \frac{28 \text{ grams}}{1 \text{ oz}} = 7,168 \text{ grams}$$

24. Lucy walks Point South Golf Club, which is 6700 yards. How many miles is that?

$$\frac{6,700 \text{ yds}}{1} \cdot \frac{3 \text{ ft}}{1 \text{ yd}} \cdot \frac{1 \text{ mile}}{5280 \text{ ft}} = 3.81 \text{ miles}$$

25. Summer's basketball court took 6 tons of cement. How many kilograms of cement is that?

$$\frac{6 \text{ tons}}{1} \cdot \frac{2000 \text{ lbs}}{1 \text{ ton}} \cdot \frac{1 \text{ kg}}{2.2 \text{ lbs}} = 5,454.54 \text{ kg}$$

26. a) Andre weighs 75 kilograms, how many pounds is that?

$$\frac{75 \text{ kg}}{1} \cdot \frac{2.2 \text{ lbs}}{1 \text{ kg}} = 165 \text{ pounds}$$

b) Hogan weighs 163 pounds, who weighs more?

Andre [165 > 163]

27. Protein drink is made with 2 ounces (weight) of powder per quart, so how many grams per liter does it take?

$$\frac{2 \text{ oz}}{1 \text{ qt}} \cdot \frac{28 \text{ g}}{1 \text{ oz}} \cdot \frac{1.05 \text{ qts}}{1 \text{ liter}} = 58.8 \text{ grams/liter}$$

28. A picture frame cutter processes a frame per minute. The company makes \$17 for each frame. How much money is he producing per hour?

$$1 \text{ frame} = 1 \text{ minute}$$

$$\text{so } 60 \text{ frames} = 60 \text{ minute} = 1 \text{ hour}$$

$$60 \text{ frames} \times \$17 = \$1,020/\text{hr}$$

**Appropriate Units**

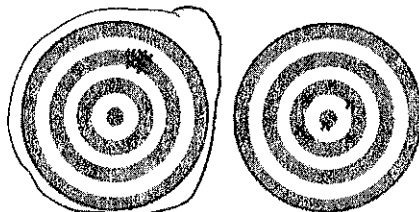
29. What is best unit to measure the area of the classroom? (multiple choice)

- a. cubic inches      b. cubic feet      c. square inches      d. square feet

} use logic!

**Accuracy vs. Precision**

30. Circle the most precise target:



31. Circle the most accurate scale if weighing a 5 pound weight. Show work!

Scale 1 = 4.85 pounds      Scale 2 = 5.1 pounds

↓  
difference of 0.15 lbs

↓  
difference of 0.1 lbs