

Prerequisite Math Practice Test for Radiography:

Basic Operations on Integers: Follow order of operations: PE ^M _D ^A _S

- Evaluate: $2(4-6) + 3 = 2(-2) + 3$
 $= -4 + 3 = (-1)$
- Evaluate: $(6-12) + (15 + (4-20)) = -6 + (15 + (-16))$
 $= -6 + (-1)$
 $= (-7)$
- Evaluate: $4 - (6 \div 2) \cdot -3 + 5 = 4 - (3 \cdot -3) + 5$
 $= 4 + 9 + 5$
 $= 18$
- Evaluate: $(12-7)^2 \div 5 - 2 = (5)^2 \div 5 - 2$
 $= 25 \div 5 - 2$
 $= 5 - 2$
 $= 3$

Ratios:

- A pattern has 3 blue triangles to every 18 yellow triangles. What is the ratio of yellow triangles to blue triangles?
 Yellow to blue. $18:3 = \frac{18}{3} = 6:1$
- A bag contains 9 red marbles and 7 blue marbles. What is the ratio of red marbles to the total marbles?
 red to total $9:16$
- A pattern has 5 blue triangles to every 20 yellow triangles. What is the ratio of yellow triangles to all triangles?
 Yellow to all $20:25 = \frac{20}{25} = \frac{4}{5} = 4:5$

Convert Between Fractions (Ratios), Decimals and Percents:

- Write $\frac{4}{5}$ as a decimal and percent
 $.8 = 80\%$
- Write 35% as a decimal and a fraction
 $.35 = \frac{35}{100} = \frac{7}{20}$
- Write 1.25 as a percent and a fraction
 $125\% = 1\frac{1}{4} = \frac{5}{4}$

Comparing Fractions and Decimals: use $<$, $>$ or $=$ to compare each of the following *Cross Multiply to compare*

11. $\frac{15}{4} > \frac{16}{11}$

12. $\frac{6}{5} = \frac{30}{25}$

13. $0.012 < 0.12$

14. $1.201 > 1.015$

Calculations with Percents:

15. What is 25% of 60?

multiply

$$.25(60) = 15$$

16. 45 is what percent of 130?

Set up a proportion

$$\frac{45}{130} = \frac{x}{100}$$

$$\frac{4500}{130} = \frac{130x}{130}$$

$$34.6\%$$

17. A 40% increase of 30 is how much?

Find 40% of 30 then add this to 30

$$.4(30) = 12$$

$$30 + 12 = 42$$

18. A decrease from 70 to 36 is what percent?

$$\text{Decrease amount: } 70 - 36 = 34$$

Decrease %: 34 is what % of 70

$$48.6\%$$

$$\frac{34}{70} = \frac{x}{100}$$

$$\frac{3400}{70} = \frac{70x}{70}$$

Conversions:

19. Convert 3.5 feet to inches

$$12 \text{ in} = 1 \text{ ft}$$

$$3.5(12) = 42 \text{ in}$$

20. Convert 4 inches to centimeters

$$1 \text{ in} = 2.54 \text{ cm}$$

$$4(2.54) = 10.16 \text{ cm}$$

21. Convert 27 centimeters to millimeters

$$27 \text{ cm} = 270 \text{ mm}$$

$$1 \text{ cm} = 10 \text{ mm}$$

22. Convert 62 millimeters to inches

$$62 \text{ mm} = 6.2 \text{ cm}$$

$$6.2 \div 2.54 = 2.44 \text{ in}$$

23. Convert 1.38 liters to kiloliters

$$1 \text{ KL} = 1000 \text{ L}$$

$$1.38 \text{ L} = .00138 \text{ KL}$$

24. Convert 1.5 gallons to cups

$$\frac{1.5 \text{ gal} | 4 \text{ qt} | 2 \text{ pt} | 2 \text{ cups}}{1 \text{ gal} | 1 \text{ qt} | 1 \text{ pt}} = 24 \text{ cups}$$

25. Convert 70°F to Celsius

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

$$C = \frac{5}{9}(70 - 32) = 21.1^\circ\text{C}$$

26. Convert 22°C to Fahrenheit

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

$$F = \frac{9}{5}(22) + 32 = 71.6^\circ\text{F}$$

Solving Proportions Word Problems:

27. If there is \$15 in a drawer and the ratio of money in the drawer to money in the piggy bank is 3:5, then how much money is in the piggy bank?

$$\frac{\text{drawer}}{\text{bank}} = \frac{3}{5} = \frac{15}{x}$$

$$\frac{3x}{3} = \frac{75}{3}$$

$$x = \$25$$

28. You have 10 apples and the ratio of apples to oranges is 5:2, so how many oranges do you have?

$$\frac{\text{apples}}{\text{oranges}} = \frac{5}{2} = \frac{10}{x}$$

$$\frac{5x}{5} = \frac{20}{5}$$

$$x = 4 \text{ oranges}$$

29. Knowing there are 2.2 pounds in one kilogram, how many kilograms does a person weigh if they are 165 pounds?

$$\frac{\text{pounds}}{\text{kg}} = \frac{2.2}{1} = \frac{165}{x} \quad \frac{2.2x = 165}{2.2 \quad 2.2} \quad \boxed{x = 75 \text{ kg}}$$

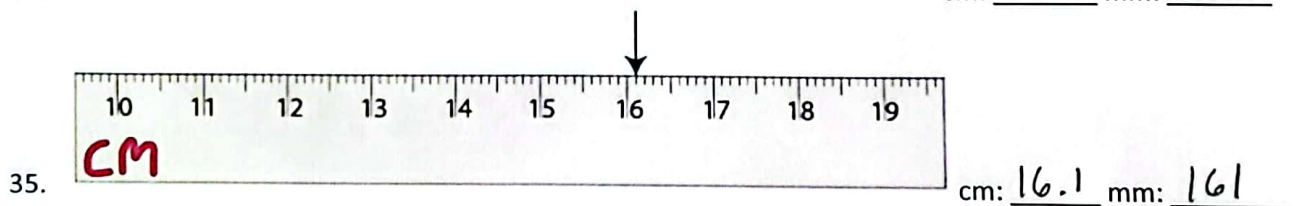
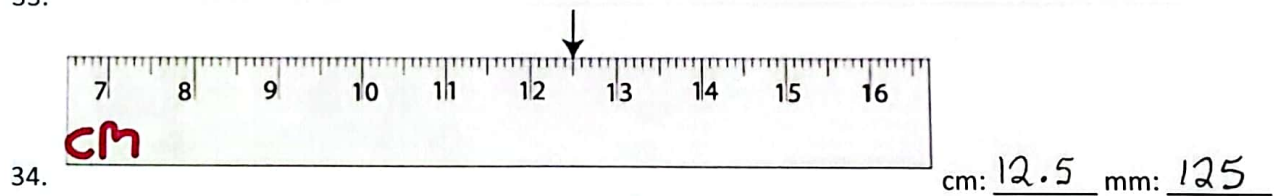
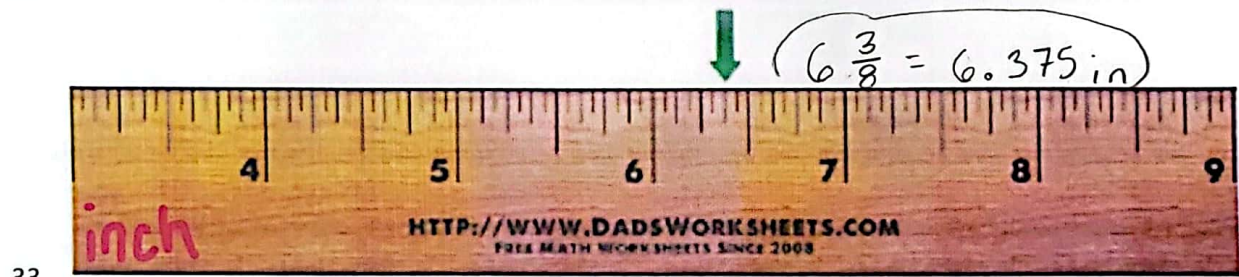
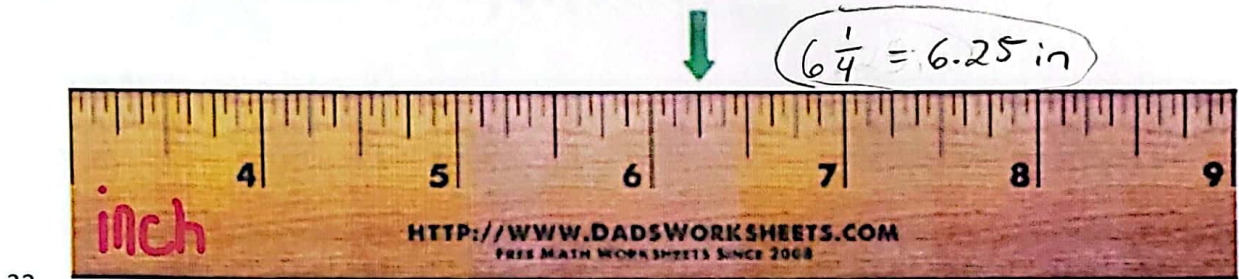
30. Knowing there are 2.2 pounds in one kilogram, how many pounds does a person weigh if they are 62 kilograms?

$$\frac{\text{pounds}}{\text{kg}} = \frac{2.2}{1} = \frac{x}{62} \quad \boxed{x = 136.4 \text{ pounds}}$$

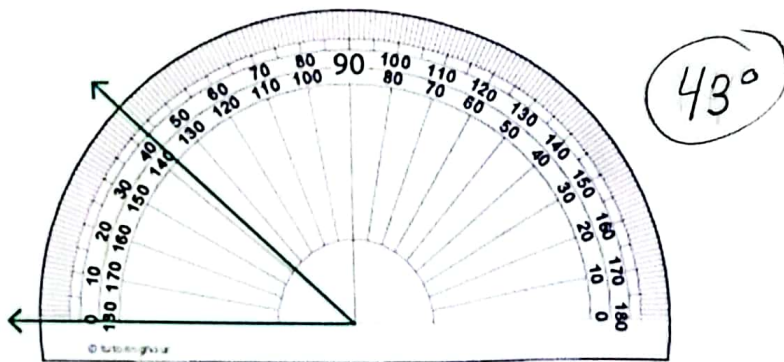
31. Knowing there are 60 drops in a teaspoon, how many teaspoons are 105 drops?

$$\frac{\text{drops}}{\text{tsp}} = \frac{60}{1} = \frac{105}{x} \quad \frac{60x = 105}{60 \quad 60} \quad \boxed{x = 1.75 \text{ tsp}}$$

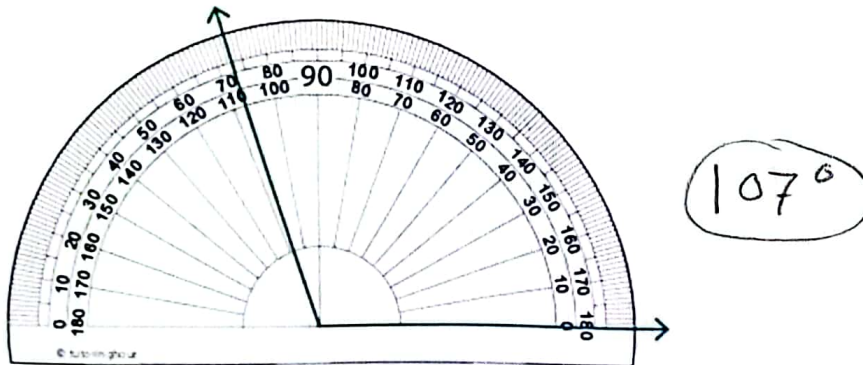
Reading a ruler: give the measurements indicated by the pointer



Reading a Protractor:



36.

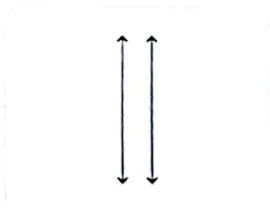


37.

Parallel and Perpendicular Lines:

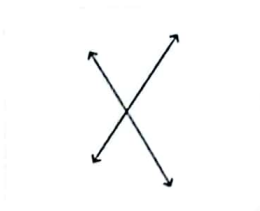
Name the following pairs of lines as parallel, perpendicular, or intersecting lines

38.



parallel

39.



intersecting

40.



Perpendicular

=> intersect at a right angle

Solving: find the value of x that makes the equation true

41. $x + 6 = 10$

$$\begin{array}{r} -6 \quad -6 \\ \hline x = 4 \end{array}$$

42. $-5 + x = 12$

$$\begin{array}{r} +5 \quad +5 \\ \hline x = 17 \end{array}$$

43. $\frac{4x}{4} = \frac{-8}{4}$

$$x = -2$$

44. $\frac{3}{2} \cdot \frac{2}{3}x = 5 \cdot \frac{3}{2}$

$$x = \frac{15}{2}$$

45. $-x - 6 = 15$

$$\begin{array}{r} +6 \quad +6 \\ \hline -x = 21 \\ \hline -1 \quad -1 \end{array} \quad x = -21$$

46. $6x + 2 = 14$

$$\begin{array}{r} -2 \quad -2 \\ \hline 6x = 12 \\ \hline 6 \quad 6 \end{array} \quad x = 2$$

47. $4(x - 5) = 2$

$$\begin{array}{r} 4x - 20 = 2 \\ +20 \quad +20 \\ \hline 4x = 22 \\ \hline 4 \quad 4 \end{array} \quad x = \frac{11}{2}$$

48. $\frac{3}{x} = \frac{27}{18}$

$$\frac{54}{27} = \frac{27x}{27} \quad x = 2$$

49. ~~$\frac{x}{1.2} = \frac{4.6}{8.3}$~~

$$\frac{8.3x}{8.3} = \frac{5.52}{8.3} \quad x = .67$$

50. ~~$\frac{4.22}{0.2} = \frac{x}{1.68}$~~

$$\frac{.2x}{.2} = \frac{7.0896}{.2}$$

$$x = 35.448$$