Prerequisite Math Practice Test for Radiography:

Basic Operations on Integers: Follow order of operations: PE $\frac{M}{D}$ $\frac{A}{S}$

1. Evaluate: $2(4-6)+3 =$ $2(-2)+3$
   $= -4+3 = -1$

2. Evaluate: $(6-12)+(15+(4-20)) =$ $-6+(15+(-16))$
   $= -6+(-1)$
   $= -7$

3. Evaluate: $4-6\div 2\cdot -3+5 =$ $4-3\cdot -3+5$
   $= 4+9+5$
   $= 18$

4. Evaluate: $(12-7)^2 \div 5 - 2 =$ $(5)^2 \div 5 - 2$
   $= 25 \div 5 - 2$
   $= 5 - 2$
   $= 3$

Ratios:

5. A pattern has 3 blue triangles to every 18 yellow triangles. What is the ratio of yellow triangles to blue triangles?

   Yellow to blue. $18:3 = \frac{18}{3} = 6:1$

6. A bag contains 9 red marbles and 7 blue marbles. What is the ratio of red marbles to the total marbles?

   red to total $9:16$

7. 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:

8. Write $\frac{4}{5}$ as a decimal and percent

   $.8 = 80\%$

9. Write 35% as a decimal and a fraction

   $.35 = \frac{35}{100} = \frac{7}{20}$

10. 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. $\frac{15}{4} > \frac{16}{11}$ (165, 64)

12. $\frac{6}{5} = \frac{30}{25}$ (150, 150)

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?

Decrease amount: $70 - 36 = 34$

Decrease %: 34 is what % of 70 $\frac{34}{70} = \frac{x}{100}$ $\frac{3400}{70} = \frac{70x}{70}$ 48.6%

Conversions:

19. Convert 3.5 feet to inches

$12 in = 1 ft$ $3.5(12) = 42 in$

20. Convert 4 inches to centimeters

$1 in = 2.54 cm$ $4(2.54) = 10.16 cm$

21. Convert 27 centimeters to millimeters

$27 cm = 270 mm$

$1 cm = 10 mm$

22. Convert 62 millimeters to inches

$62 mm = 6.2 cm$ $6.2 \div 2.54 = 2.44 in$

23. Convert 1.38 liters to kiloliters

$1 KL = 1000 L$ $1.38 L = .00138 KL$

24. Convert 1.5 gallons to cups

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

25. Convert 70°F to Celsius

$C = \frac{5}{9}(F - 32)$ $C = \frac{5}{9}(70 - 32) = 21.1°C$

26. Convert 22°C to Fahrenheit

$F = \frac{9}{5}C + 32$ $F = \frac{9}{5}(22) + 32 = 71.6°F$

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?

$\frac{\text{apples}}{\text{oranges}} = \frac{5}{2} = \frac{10}{x}$ $\frac{5x}{5} = \frac{20}{5}$

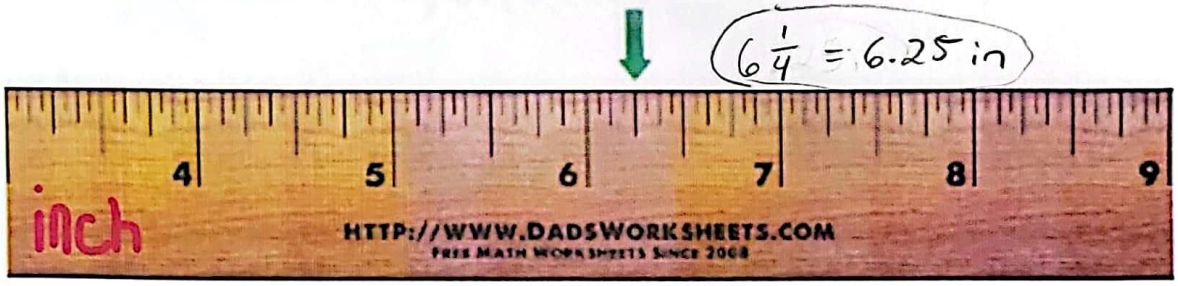
$x = 4$ oranges

29. Knowing there are 2.2 pounds in one kilogram, how many kilograms does a person weigh if they are 165 pounds? $\frac{\text{pounds}}{kg} = \frac{2.2}{1} = \frac{165}{x}$ $\frac{2.2x}{2.2} = \frac{165}{2.2}$ $x = 75\ kg$

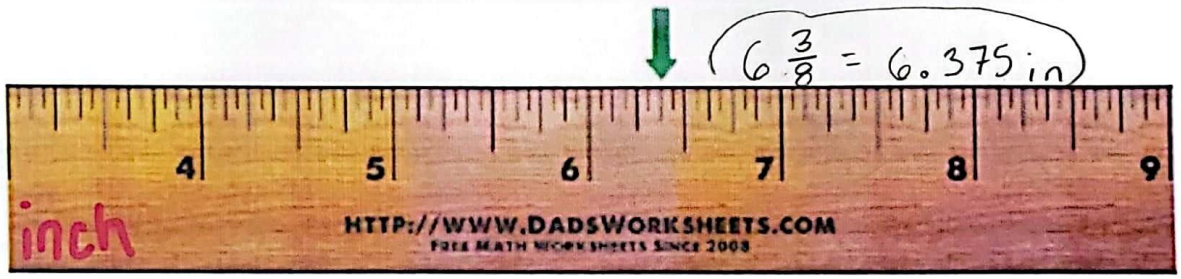
30. Knowing there are 2.2 pounds in one kilogram, how many pounds does a person weigh if they are 62 kilograms?
$\frac{\text{pounds}}{kg} = \frac{2.2}{1} = \frac{x}{62}$ $x = 136.4$ pounds

31. Knowing there are 60 drops in a teaspoon, how many teaspoons are 105 drops?
$\frac{\text{drops}}{tsp} = \frac{60}{1} = \frac{105}{x}$ $\frac{60x}{60} = \frac{105}{60}$ $x = 1.75\ tsp$

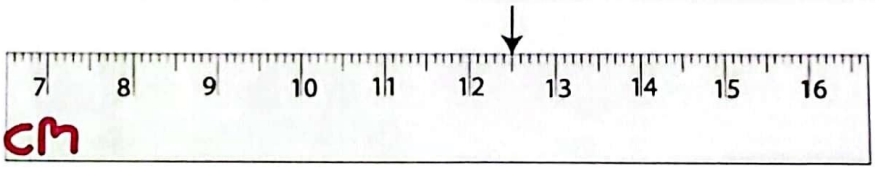
Reading a ruler: give the measurements indicated by the pointer

32. 

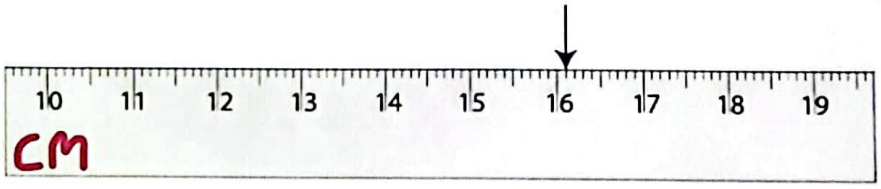
$6\frac{1}{4} = 6.25$ in

33. 

$6\frac{3}{8} = 6.375$ in

34. 

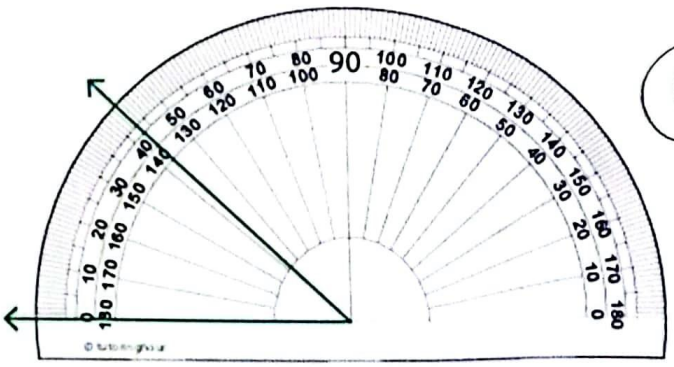
cm: 12.5 mm: 125

35. 

cm: 16.1 mm: 161

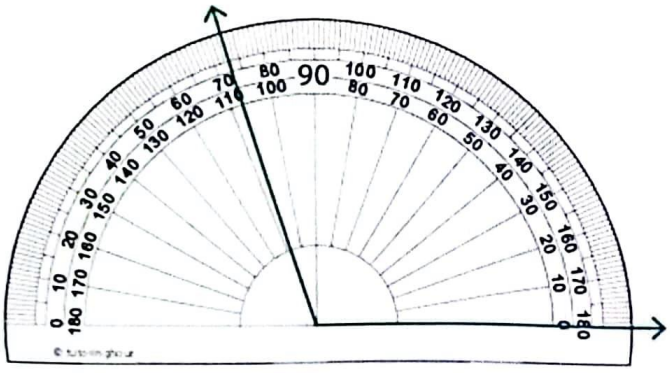
Reading a Protractor:

36.



43°

37.

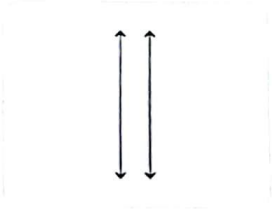


107°

Parallel and Perpendicular Lines:

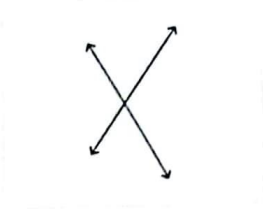
Name the following pairs of lines as parallel, perpendicular, or intersecting lines

38.



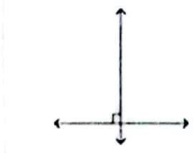
parallel

39.



intersecting

40.



Perpendicular

=> intersect at a right angle

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

41. $x + 6 = 10$

$-6 \quad -6$

$x = 4$

42. $-5 + x = 12$

$+5 \quad +5$

$x = 17$

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. $-x - 6 = 15$

$+6 \quad +6$

$\frac{-x}{-1} = \frac{21}{-1}$ $x = -21$

46. $6x + 2 = 14$

$-2 \quad -2$

$\frac{6x}{6} = \frac{12}{6}$ $x = 2$

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

$4x - 20 = 2$

$+20 \quad +20$

$\frac{4x}{4} = \frac{22}{4}$ $x = \frac{11}{2}$

48. $\frac{3}{x} = \frac{27}{18}$ $\frac{54}{27} = \frac{27x}{27}$ $x = 2$

49. $\frac{x}{1.2} = \frac{4.6}{8.3}$ $\frac{8.3x}{8.3} = \frac{5.52}{8.3}$ $x = .67$

50. $\frac{4.22}{0.2} = \frac{x}{1.68}$ $\frac{.2x}{.2} = \frac{7.0896}{.2}$

$x = 35.448$