

Prerequisite Math Practice for Dental Hygiene Program:

Basic Operations on Integers: Follow order of Operations: PE ^M ^A _D _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: $4(-6 \div 2) - 3 + 5 = 4(-3) - 3 + 5 = -12 - 3 + 5 = -18$

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

Basic Operations on Fractions:

5. Evaluate: $\frac{5}{4} + \frac{9}{8} = \frac{10}{8} + \frac{9}{8} = \frac{19}{8}$

6. Evaluate: $\frac{2}{7} - \frac{3}{5} = \frac{10}{35} - \frac{21}{35} = \frac{-11}{35}$

7. Evaluate: $\frac{5}{9} \cdot \frac{3}{10} = \frac{1}{6}$

or multiply: $\frac{\text{top} \cdot \text{top}}{\text{bottom} \cdot \text{bottom}}$
then reduce

$\frac{5}{9} \cdot \frac{3}{10} = \frac{15}{90} = \frac{1}{6}$

8. Evaluate: $\frac{11}{15} \div \frac{22}{3} = \frac{11}{15} \cdot \frac{3}{22} = \frac{1}{10}$

9. Evaluate: $\frac{4}{5} \left(\frac{2-7}{3-6} \right) + \left(\frac{1}{2} \div \frac{5}{8} \right) = \frac{4}{5} \left(\frac{-5}{-3} \right) + \left(\frac{1}{2} \cdot \frac{8}{5} \right) = \frac{4}{5} \left(\frac{5}{3} \right) + \frac{4}{5}$

$= \frac{20}{15} + \frac{4}{5} = \frac{20}{15} + \frac{12}{15} = \frac{32}{15}$

Ratios:

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

Yellow to blue = $\frac{18}{3} = \frac{6}{1}$ (6:1) or 6 to 1

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

Total = 16 red to total = $\frac{9}{16}$ (9:16) or 9 to 16

12. A pattern has 5 blue triangles to every 20 yellow triangles. What is the ratio of yellow triangles to all triangles?

All = 25 Yellow to All = $\frac{20}{25} = \frac{4}{5}$ (4:5) or 4 to 5

Convert Between Fractions (Ratios), Decimals and Percents:

13. Write $\frac{4}{5}$ as a decimal and percent $\frac{4}{5} = .8 = 80\%$
→ 4 ÷ 5

14. Write 35% as a decimal and a fraction $35\% = .35 = \frac{35}{100} = \frac{7}{20}$

15. Write 1.25 as a percent and a fraction $1.25 = 125\% = 1\frac{1}{4} = \frac{5}{4}$

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

Cross multiply to compare fractions

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

$15 \cdot 11 = 165$
 $4 \cdot 16 = 64$

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

$6 \cdot 25 = 150$
 $5 \cdot 30 = 150$

18. $0.012 < 0.12$

19. $1.201 > 1.015$

Calculations with Percents:

20. What is 25% of 60?
of = multiply $.25 \cdot 60 = 15$

21. 45 is what percent of 130?
set up a proportion $\frac{45}{130} = \frac{?}{100}$ $\frac{100 \cdot 45}{130} = 34.62\%$

22. A 40% increase of 30 is how much?
 $40\% \text{ of } 30 = .4 \cdot 30 = 12$
 $30 + 40\% \text{ of } 30 = 30 + 12 = 42$

23. A decrease from 70 to 36 is what percent?
 $70 - 36 = 34$ $\frac{34}{70} = \frac{?}{100}$ $\frac{34 \cdot 100}{70} = 48.57\% \text{ decrease}$

Solving Proportions Word Problems:

ratio = ratio solve by cross multiplying

24. 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?
 $\frac{3}{5} = \frac{15}{x}$ $\frac{3x}{3} = \frac{5 \cdot 15}{3}$ $x = 25$

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

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

27. Knowing there are 2.2 pounds in one kilogram, how many pounds does a person weigh if they are 62 kilograms?
 $\frac{2.2}{1} = \frac{x}{62}$ $62 \cdot 2.2 = x$ $136 = x$ *pounds*

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

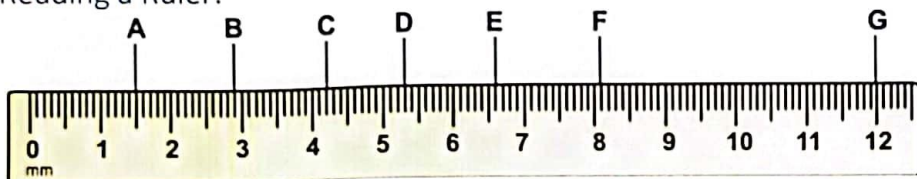
drops : teaspoon

$$\frac{60}{1} = \frac{105}{x}$$

$$\frac{60x}{60} = \frac{105}{60}$$

$x = 1.75$
teaspoons

Reading a Ruler:



29. Length A is 1.5 mm

30. Length B is 2.9 mm

31. Length C is 4.2 mm

32. Length D is 5.3 mm

33. Length E is 6.6 mm

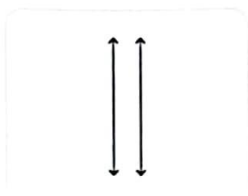
34. Length F is 8.1 mm

35. Length G is 12 mm

Parallel and Perpendicular Lines:

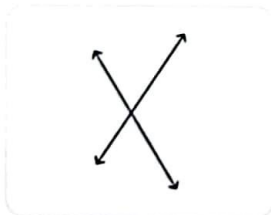
Name the following pairs of lines as parallel, perpendicular, or intersecting lines

36.



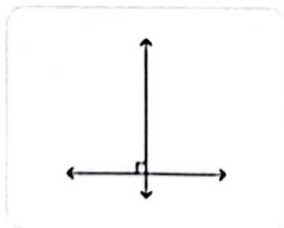
parallel

37.



intersecting

38.



perpendicular
↳ intersect
at a right angle.