ESSAY

Directions: Solve the following problems.

1. Add and reduce to lowest terms: $\frac{7}{8} + \frac{1}{8}$

   ANS:
   $\frac{7}{8} + \frac{1}{8} = \frac{8}{8} = 1$

2. Add: $\frac{1}{3} + \frac{1}{8}$

   ANS:
   $\frac{1}{3} + \frac{1}{8} = \frac{8}{24} + \frac{3}{24} = \frac{11}{24}$

3. Multiply and reduce to lowest terms: $\frac{2}{3} \times \frac{1}{8}$

   ANS:
   $\frac{2}{3} \times \frac{1}{8} = \frac{2}{24} = \frac{1}{12}$

4. Multiply and reduce to lowest terms: $\frac{1}{4} \times \frac{1}{10}$

   ANS:
   $\frac{1}{4} \times \frac{1}{10} = \frac{1}{40}$

5. Divide and reduce to lowest terms: $\frac{1}{4} \div \frac{3}{8}$

   ANS:
   $\frac{1}{4} \div \frac{3}{8} = \frac{1}{4} \times \frac{8}{3} = \frac{8}{12} = \frac{2}{3}$

6. Divide and reduce to lowest terms: $\frac{1}{2} \div \frac{1}{6}$

   ANS:
   $\frac{1}{2} \div \frac{1}{6} = \frac{1}{2} \times \frac{6}{1} = 3$

7. Which is greater, $\frac{1}{7}$ or $\frac{1}{9}$?

ANS:
$\frac{1}{7}$

8. Which is smaller, $\frac{1}{6}$ or $\frac{1}{8}$

ANS:
$\frac{1}{8}$

9. Change to a decimal: $\frac{1}{8}$

ANS:
0.125

10. Change to a fraction: 0.008

ANS:
$\frac{8}{1000}\left(\text{reduce to } \frac{1}{125}\right)$

11. Which is smaller, 0.125 or 0.25?

ANS:
0.125

12. Which is greater, 0.25 or 0.05?

ANS:
0.25

13. Round to the nearest tenth: 3.124

ANS:
3.1

14. Round to the nearest hundredth: 0.42877

ANS:
0.43

15. Round to the nearest whole number: 5.742

ANS:
6

16. Round to the nearest ten thousandth: 0.576391

    ANS:
    0.5764

17. Divide 7.35 by 0.25.

    ANS:
    29.4

18. Multiply 4.25 by 0.2.

    ANS:
    0.85

19. Find 5% of 75.

    ANS:
    $0.05 \times 75 = 3.75$ (10% of 75 is 7.5; 5% would be one half of that)

20. Find 55% of 120.

    ANS:
    $0.55 \times 120 = 66$ (a little more than one half of 120)

21. Write $\frac{1}{10}$ as a percentage and as a decimal.

    ANS:
    10%, 0.1

22. Write 0.05 as a fraction and as a percentage.

    ANS:
    $\frac{5}{100}$ $\left(\text{reduce to } \frac{1}{20}\right)$, 5%

23. Write 85% as a fraction and as a decimal.

    ANS:
    $\frac{85}{100}$ $\left(\text{reduce to } \frac{17}{20}\right)$, 0.85

24. Change $1\frac{1}{5}$ to an improper fraction.

    ANS:
    $\frac{6}{5}$

25. Change $\frac{20}{3}$ to a whole or mixed number.

ANS:

$6\frac{2}{3}$

26. Which is larger, tens or tenths?

ANS:
Tens

27. Write three hundred seventy seven thousandths as a decimal.

ANS:
0.377

28. Make 150 mL of a 50% strength solution. How many mL of the solute will be needed?

ANS:
75 mL

Know   *Want to Know*
1 mL : 2 mL = x mL : 150 mL
$2x = 1 \times 150 = 150$
$x = 75$ mL

Proof: $1 \times 150 = 150$
           $2 \times 75 = 150$

29. You need to make a 75% Betadine solution for a total of 250 mL. How much Betadine will you need?

ANS:
187.5 mL

Know   *Want to Know*
75 mL : 100 mL = x mL : 250 mL
3 : 4 = x : 250
$4x = 3 \times 250 = 750$
$4x = 750$ mL
$x = 187.5$ mL of Betadine. Add 62.50 mL of solution for a total of 250 mL.

Proof: $3 \times 250 = 750$
         $4 \times 187.5 = 750$

30. You need to make a 10% solution of hydrogen peroxide for a total of 500 mL. You are using normal saline (NS) as the solvent. How many mL of hydrogen peroxide will you need?

ANS:

50 mL

Know   *Want to Know*
10 mL : 100 mL = x mL : 500 mL
1 : 10 = x mL : 500 mL
$10x = 1 \times 500 = 500$
$x = 50$ mL of hydrogen peroxide. Add 450 mL of NS to make 500 mL of a 10% solution.

Proof: $50 \times 10 = 500$
           $1 \times 500 = 500$

Directions:
CALCULATING SOLUTIONS
Health care professionals need to know how to prepare solutions from stock solutions. A solution consists of a solute (concentrate) plus a solvent (liquid). A solute can be either liquid or a powder, and a solvent can be either water or NS. The resulting reconstituted solution will be a weaker strength than the original. The strength of the solution is represented by a ratio of solute to solvent. Many times health care workers have to prepare solutions for irrigations, tube feedings, infant formulas, or perhaps cleaning solutions. This worksheet will give the student practice making up different types and strengths of solutions.

Prepare a 100 mL of a $\frac{1}{3}$ strength solution of hydrogen peroxide (solute) using NS (solvent).

This means one part hydrogen peroxide (solute) to three parts of NS (solvent).

EXAMPLE:
Know   *Want to Know*
1 : 3 = x : 100
$3x = 1 \times 100 = 100$
$3x = 33.33$ mL of the solute hydrogen peroxide needed

Proof: $1 \times 100 = 100$
$3 \times 33.33 = 99.9$
100 mL solution wanted
$\underline{-33.33 \text{ mL}}$ hydrogen peroxide
66.67 mL of NS

66.67 mL of NS added to the 33.33 mL of hydrogen peroxide yields 100 mL of a $\frac{1}{3}$ strength hydrogen peroxide solution for irrigation.

31. Prepare a 70% Betadine solution for traction pin care. Cleanse area twice daily with 10 mL of a 70% Betadine solution with NS.
a. How many mL of total solution will you prepare?
b. How many mL of Betadine will be needed?
c. How many mL of NS will you add?

ANS:
a. 10×2 times per day = 20 mL of 70% Betadine solution should be prepared.