

MAT 102 Proficiency Test

Students who pass the MAT 102 Proficiency Test will earn two credit hours for the Mathematics for Allied Health course

Candidates must score 90 percent on the test to receive credit. Students who score 75 percent are eligible for a retake. They must be proficient in calculating medication doses using metric measures. Students who do not pass the test must take the MAT 102 course. The fee for the test is \$25.

The prerequisite for the course or the test is placement in MAT 110 on Oakton's math placement test or successful completion of MAT 070.

- Students can arrange to take the test at the Testing Center at the Des Plaines campus.
- The test is administered on computer.
- There are 26 questions.
- The time limit is two (2) hours.
- Books and notes are not allowed.
- A simple calculator and scratch paper will be provided by the Testing Center.

MAT 102 Success Checklist

1. Continue practicing the problems in the MAT 102 Proficiency Test workshop handout.
2. Study the most current MAT 102 textbook on reserve in Oakton's library at both campuses.
3. Call the Testing Center, Room 2409 Des Plaines, 847.635.1939 to make an appointment to take the test.
4. On the day of the test, go to the Testing Center to pick up a payment form to take to the Cashier in the Enrollment Center to pay the \$25 fee. The payment form and Oakton receipt must be returned to the Testing Center before the test can be administered.

At the time of the test, you must show a photo I.D.

What do I need to know for the MAT 102 Proficiency Exam?

Types of Questions

1. Calculating dosage, tablets, IV or IM, with or without unit conversions. Standard and apothecary units of measure.

Ordered: Myambutol 1.2 g, po qd
 Available: Myambutol 400 mg per tablet
 How many tablets of Myambutol will you give?

$$1.2\text{g} = 1200\text{ mg} \quad \frac{400\text{mg}}{1\text{ tab}} = \frac{1200\text{ mg}}{x\text{ tab}} \quad \frac{400x}{400} = \frac{1200}{400} \quad x = 3\text{ tablets}$$

2. Calculating dosage based upon body weight.

Ordered: Tetracycline Elixir qid for a child weighing 90 lbs at a dosage of 8 mg/kg/day
 Available: Tetracycline 50 mg per 7 mL
 How many mL should you give per dose? Per day?

$$\frac{1\text{ kg}}{2.2\text{ lbs}} = \frac{x\text{ kg}}{55\text{ lbs}} \quad \frac{2.2x}{2.2} = \frac{90}{2.2} \quad x \approx 41\text{ kg} \quad \frac{8\text{ mg}}{1\text{ kg}} = \frac{x\text{ mg}}{41\text{ kg}} \quad x = 328\text{ mg}$$

$$\frac{50\text{ mg}}{7\text{ mL}} = \frac{328\text{ mg}}{x\text{ mL}} \quad \frac{50x}{50} = \frac{2296}{50} \quad x \approx 46 \frac{\text{mL}}{\text{day}} \quad 46 \div 4 \approx 12\text{ mL/dose}$$

3. IV Calculations; drip rate (infusion set) or flow rate (infusion pump)

An IV of 1000 mL was ordered to infuse in 8 hours. With 3 hours to infusion time left you discover that 600 mL have infused. The set delivers 20 gtt/mL. Recalculate the drip rate to deliver the fluid on time.

$$\frac{20\text{ gtt}}{1\text{ mL}} = \frac{x\text{ gtt}}{400\text{ mL}} \quad x = 8000\text{ gtt} \quad 3\text{hrs} \times 60\text{ min} = 180\text{ min}$$

$$\frac{8000\text{ gtt}}{180\text{ min}} = \frac{x\text{ gtt}}{1\text{ min}} \quad \frac{180x}{180} = \frac{8000}{180} \quad x \approx 44\text{ gtt/min}$$

4. IV Calculations; flow time; infusion set or infusion pump.

The doctor orders 1000 mL of penicillin G potassium. The administration set delivers 10gtt/mL and the flow rate is 21 gtt/min.

How much time will it take to infuse the IV?

$$\frac{10\text{ gtt}}{1\text{ mL}} = \frac{x\text{ gtt}}{1000\text{ mL}} \quad x = 10000\text{ gtt} \quad \frac{21\text{ gtt}}{1\text{ min}} = \frac{10000\text{ gtt}}{x\text{ min}} \quad \frac{21x}{21} = \frac{10000}{21} \quad x = 476\text{ min} \approx 8\text{ hrs}$$

5. Reading Drug Labels to determine the amount of diluent, type of diluent, dosage strength and length of potency.

Required Terms and Units of Measure

Drug Delivery

| | |
|---------|-----------------------|
| IM | intramuscularly |
| IV | intravenously |
| IVP | intravenous push |
| IVPB | intravenous piggyback |
| SC (SQ) | subcutaneously |

Standard Units of Measure

| | |
|---------------|------------------------------|
| cc | cubic centimeter (1cc = 1mL) |
| g (gm, Gm) | gram |
| kg (Kg) | kilogram |
| L | liter |
| µg (mcg) | microgram (1000mcg = 1mg) |
| mEq | milliequivalent |
| mg | milligram |
| mL (ml) | milliliter |
| unit (U) | unit |
| tbsp. (T) | tablespoon (1 tbs = 15 mL) |
| tsp (t) | teaspoon (1 tsp = 5mL) |
| oz | ounce (1 oz = 30 mL) |
| 1 kg = 2.2lbs | |

Metric Prefixes

Kilo hecto deca unit (gram or liters) deci centi milli _____ _____ micro

Drug Administration

| | |
|--------------|----------------------|
| qd | every day, daily |
| bid | twice a day |
| tid | three times a day |
| qid | four times a day |
| qh | every hour |
| stat | immediately |
| q2h or q2* | every 2 hours |
| q4h or q4* | every 4 hours |
| q6h or q6* | every 6 hours |
| q8h or q8* | every 8 hours |
| q12h or q12* | every 12 hours |
| qod | every other day |
| prn | as needed |
| tiw | three times per week |
| biw | twice per week |

Common IV Fluids

| | |
|--------|------------------------------|
| D | = dextrose |
| W | = water |
| NS | = normal saline |
| D5W | = 5% dextrose in water, etc. |
| 0.9%NS | = 0.9% saline in water, etc. |

Apothecary Units of Measure

| | |
|-------------|--|
| dr | dram liquid (1 dram = 4mL) |
| oz | ounce liquid (1 ounce = 32mL) |
| gr | grain - weight of a grain of wheat |
| gtt | drop (1 drop = 1minim) |
| m | minim |
| i | one (ex: gr i = one grain) |
| ss | one-half (ex: gr ii ss = 2 ½ grains, etc.) |
| 1 gr = 60mg | |

MAT 102 MATH REVIEW

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Simplify each fraction.

1) $\frac{15}{24}$

2) $\frac{30}{70}$

3) $\frac{33}{42}$

4) $\frac{100}{140}$

5) $\frac{240}{915}$

6) $\frac{294}{546}$

Multiply. Write the product in the simplest form.

7) $\frac{1}{6} * \frac{5}{9}$

8) $\frac{8}{3} * \frac{7}{22}$

9) $\frac{3}{8} * \frac{1}{7}$

10) $\frac{5}{10} * \frac{6}{22}$

Divide. Write all quotients in simplest form.

11) $\frac{8}{14} \div \frac{1}{15}$

12) $240 \div \frac{2}{3}$

Write all fractions as a decimal. Round to the nearest thousandth if necessary.

13) $\frac{7}{8}$

14) $\frac{13}{38}$

15) $\frac{205}{291}$

16) $\frac{17}{15}$

Write the decimal as a fraction or mixed number in lowest terms.

17) 0.92

18) 0.864

19) 0.312

20) 1.01

21) 5.8

22) 80.400

23) 20.71

24) 697.8102

Divide and round the quotient as indicated.

25) Divide 6.27 by 25 and round the quotient to the nearest hundredths.

26) Divide 6.51 by 0.059 and round the quotient to the nearest hundredths

27) Divide 132.25 by 5.1 and round the quotient to the nearest hundredths

28) Divide 2.169 by 3.1 and round the quotient to the nearest hundredths

29) Divide 1068.18 by 0.026 and round the quotient to the nearest thousandths

Insert <, >, or = between each pair of numbers to form a true statement.

30) 0.933 ___ 0.934

31) 0.294 ___ 0.284

32) 0.838 _____ 0.818

Arrange in order from smallest to largest.

33) 0.05, 0.04, 0.045, 0.054

34) 0.082, 0.028, 0.022, 0.088

35) 2.763, 2.637, 2.673, 2.367

Write each percent as a decimal.

36) 66%

37) 600%

38) 170%

39) 15.98%

40) 0.11%

41) 0.003%

Write each percent as a fraction or mixed number in simplest form.

42) 16%

43) 276%

44) $66\frac{2}{3}\%$

45) $185\frac{5}{7}\%$

46) $\frac{1}{2}\%$

47) 0.7%

Solve each proportion for the given variable. Round the solution where indicated.

48) $\frac{x}{57} = \frac{5}{19}$

49) $\frac{3}{x} = \frac{3}{4}$

50) $\frac{1}{2} = \frac{x}{9}$

51) $\frac{1}{3} = \frac{x}{16}$

52) $\frac{2}{9} = \frac{9}{x}$

53) $\frac{1}{x} = \frac{4}{22}$

Solve each proportion for the given variable.

54) $\frac{1}{3\frac{1}{4}} = \frac{x}{26}$

55) $\frac{5}{x} = \frac{0.9}{2.7}$

56) $\frac{6}{\frac{2}{5}} = \frac{30}{x}$

57) $\frac{16}{x} = \frac{8}{\frac{1}{3}}$

58) $\frac{x}{\frac{3}{9}} = \frac{2\frac{1}{4}}{1\frac{1}{2}}$

59) $\frac{2.7}{n} = \frac{1.2}{5.9}$ Round to the nearest tenth.

60) $\frac{x}{8.1} = \frac{0.07}{9}$ Round to the nearest hundredth.

61) $\frac{61}{3} = \frac{7}{z}$ Round to the nearest thousandth.

MAT 102 Math Review Test Answer Key

- | | | | |
|-----------------------|--------------------------------|----------------------|-------------------|
| 1) $\frac{5}{8}$ | 20) $1\frac{1}{100}$ | 39) 0.1598 | 58) $\frac{1}{2}$ |
| 2) $\frac{3}{7}$ | 21) $5\frac{4}{5}$ | 40) 0.0011 | 59) 13.3 |
| 3) $\frac{11}{14}$ | 22) $80\frac{2}{5}$ | 41) 0.00003 | 60) 0.06 |
| 4) $\frac{5}{7}$ | 23) $20\frac{71}{100}$ | 42) $\frac{4}{25}$ | 61) 0.344 |
| 5) $\frac{16}{61}$ | 24) $697\frac{4051}{5000}$ | 43) $2\frac{19}{25}$ | |
| 6) $\frac{7}{13}$ | 25) 0.25 | 44) $\frac{2}{3}$ | |
| 7) $\frac{5}{54}$ | 26) 110.34 | 45) $1\frac{6}{7}$ | |
| 8) $\frac{28}{33}$ | 27) 25.93 | 46) $\frac{1}{200}$ | |
| 9) $\frac{3}{56}$ | 28) 0.70 | 47) $\frac{7}{1000}$ | |
| 10) $\frac{3}{22}$ | 29) 41,083.846 | 48) 15 | |
| 11) $\frac{60}{7}$ | 30) < | 49) 4 | |
| 12) 360 | 31) > | 50) $4\frac{1}{2}$ | |
| 13) 0.875 | 32) > | 51) $5\frac{1}{3}$ | |
| 14) 0.342 | 33) 0.04, 0.045, 0.05, 0.054 | 52) $40\frac{1}{2}$ | |
| 15) 0.704 | 34) 0.022, 0.028, 0.082, 0.088 | 53) $5\frac{1}{2}$ | |
| 16) 1.133 | 35) 2.367, 2.637, 2.673, 2.763 | 54) 8 | |
| 17) $\frac{23}{25}$ | 36) 0.66 | 55) 15 | |
| 18) $\frac{108}{125}$ | 37) 6 | 56) 2 | |
| 19) $\frac{39}{125}$ | 38) 1.7 | 57) $\frac{2}{3}$ | |

Math Examples and Tips for Math 102

Simplify Fractions

Look for the largest number that divides evenly into both the numerator and the denominator (common factors). Factor both and reduce.

$$\frac{54}{99} = \frac{9 \times 6}{9 \times 11} = \frac{6}{11}$$

Multiply Fractions

Look for common factors of numerators and denominators. Divide each by the common factor. Multiply straight across—numerator with numerator, and denominator with denominator

$$\frac{4}{15} \times \frac{3}{2} = \frac{2}{5}$$

Divide fractions

Change into a multiplication problem by flipping the second fraction around (reciprocal). Now follow the steps for fraction multiplication

$$\frac{7}{20} \div \frac{14}{2} = \frac{7}{20} \times \frac{2}{14} = \frac{1}{20}$$

If you are multiplying and dividing with or without mixed numbers, first change them into fractions. Put a 1 under the whole numbers. For mixed numbers multiply the whole number with the denominator and add the numerator. This is your new numerator. $3 \times 5 + 4 = 19$

$$25 \times 3\frac{4}{5} = \frac{25}{1} \times \frac{19}{5}$$

$$\frac{95}{1} = 95$$

Fractions to decimals

Divide the numerator by the denominator. Put a decimal after the numerator followed by zeros as needed.

$$\frac{5}{16} = 16\sqrt{5.000} = 0.3125$$

Rounding Decimals

Look to the right of the place you are rounding. If that number is 0, 1, 2, 3 or 4 just drop the numbers to the right. If the number is 5, 6, 7, 8, 9 then add 1 to the digit, then drop the numbers to the right.

0.3125 rounded to 0.31 to the nearest hundredth
0.3125 rounded to 0.313 to the nearest thousandth

Decimal to fractions

Read the decimal, remembering place values. The last word you say is the denominator. Reduce if necessary.

0.0125 is one hundred twenty-five thousandths

$$\frac{125}{10000} = \frac{1}{80}$$

Decimal tenth hundredth thousandth ten-thousandth

hundred-thousandth

Dividing Decimals

If the divisor has a decimal, move it to the right. Move the dividend the same number of places to the right. Bring the decimal up and perform regular division. Add zeros to the dividend to continue. Be careful to line everything up. You do not need to continue until the division stops. Often you only round to the tenth or the hundredths place.

$$\begin{array}{r} \overline{.513} \overline{)1.0773} \\ \underline{1026} \\ 513 \\ \underline{513} \\ 0 \end{array}$$

Comparing Decimals

Compare tenth with tenth, hundredth with hundredth, etc. until they are different. The number with the larger digit at this point, is the larger number.

0.25 with 0.245
 tenths – the same, 2
 hundredths – different $5 > 4$
 so $0.25 > 0.245$

Removing %

Divide by 100 to remove a % sign. If there is a decimal you can just move the decimal two places to the left (which is the same as dividing by 100).

$$\begin{aligned} 6.78\% &= 0.0678 \\ 12\frac{1}{5}\% \div 100 &= \frac{61}{5} \div \frac{100}{1} \\ \frac{61}{5} \times \frac{1}{100} &= \frac{61}{500} \end{aligned}$$

Solving Proportions

Cross-multiply, divide each side by the coefficient (number next to) the x, and then reduce.

$$\frac{45}{180} = \frac{3}{x} \quad \frac{45x}{45} = \frac{540}{45}$$

$$x = 12$$

Abbreviations

Drug Administration Abbreviation meanings

| | |
|--------------|---------------------------|
| ac | before meals |
| pc | after meals |
| qd | every day, daily |
| bid | twice a day |
| tid | three times a day |
| qid | four times a day |
| qh | every hour |
| hs | at bedtime, hour of sleep |
| qn | every night |
| stat | immediately |
| q2h or q2° | every 2 hours |
| q4h or q4° | every 4 hours |
| q6h or q6° | every 6 hours |
| q8h or q8° | every 8 hours |
| q12h or q12° | every 12 hours |
| qod | every other day |
| prn | as needed |
| tiw | three times per week |
| biw | twice per week |
| AD | right ear |
| AL | left ear |
| AU | each ear |
| HHN | hand-held nebulizer |
| MDI | metered-dose inhaler |
| NGT(ng) | nasogastric tube |
| OD | right eye |
| OS | left eye |
| OU | both eyes |
| Po (PO) | by mouth |
| Pr (PR) | in the rectum |
| SL | sublingual, under tongue |
| S & S | swish and swallow |

Measure Abbreviation meanings

| | |
|-----------------|-------------------------------|
| cc | cubic centimeter (1cc = 1mL) |
| G (gm, Gm) | gram |
| kg(Kg) | kilogram |
| L | liter |
| µg(mcg) | microgram (1000mcg = 1mg) mEq |
| milliequivalent | |
| mg | milligram |
| mL(ml) | milliliter |
| unit(U) | unit |
| | 1 kg = 2.2 lbs |
| pt | pint (1 ≈ 500 mL) |
| qt | quart (1 qt ≈ 1000 mL) |

Apothecary Meaning

| | |
|--------|------------------------------------|
| dr | dram liquid (1 dram = 4mL) |
| oz | ounce liquid (1 ounce = 32mL) |
| gr | grain - weight of a grain of wheat |
| | 1 gr = 60 mg |
| gtt | drop (1 drop = 1minim) |
| m | minim |
| ss | one-half |
| i | one ex: gr i = one grain |
| i ss | one-and-one half |
| ii | two |
| iii | three |
| iv | four |
| v | five |
| vii | seven |
| vii ss | seven-and-a-half |
| x | ten |
| xv | fifteen |

Kilo hecto deca unit (gram or liters) deci centi milli _____ micro

Drug Preparations

Oral Route

| | |
|-----------|---------------------|
| Cap, caps | capsule |
| CR | controlled- release |
| LA | long-acting |
| SA | sustained-action |
| SR | slow release |
| DS | double-strength |
| EC | enteric-coated |
| el, elix | Elixir |
| sol | solution |
| sp | spirit |
| sup, supp | suppository |
| susp | suspension |
| syr | syrup |
| tab, tabs | tablets |
| tr, tinct | Tincture |
| KVO | keep vein open |
| D/C | discontinue |
| NKA | no known allergies |

Parenteral Route (by injection)

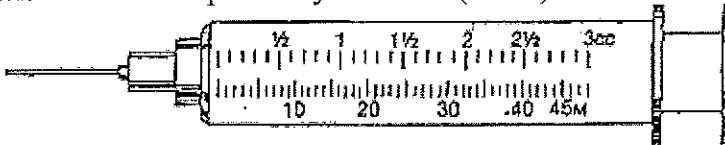
| | |
|--------|-----------------------|
| IM | intramuscularly |
| IV | intravenously |
| IVP | intravenous push |
| IVPB | intravenous piggyback |
| SC(SQ) | subcutaneously |

Topical Route

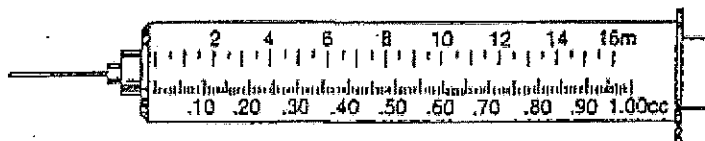
| | |
|------------|----------|
| ung, oint. | ointment |
| | Cream |
| | lotion |

Types of Syringes

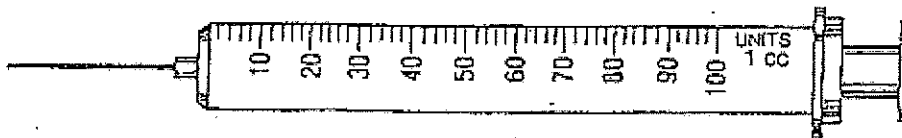
3 mL with metric and apothecary measures (tenths)



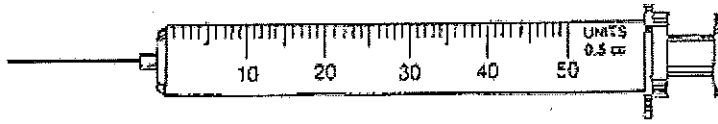
1 mL with metric and apothecary measures (hundredths)



1 mL insulin (for U 100 insulin)



½ mL Low dose insulin (for U 50 insulin)



Steps for Reconstituting Powders with Directions

1. Read the order
2. Identify the stock
3. Dilute the fluid
4. Identify the solution
5. Set up the proportions and solve
6. Write on the label
7. Store according to directions

Common IV Fluids

D = dextrose

W = Water

NS = normal saline

D5W = 5% dextrose in water

0.9% NS = 0.9% saline in water, etc.

Drip Factors

Infusion sets administer intravenous fluids. They consist of plastic tubing attached at one end to the IV bag and at the other end to a needle or catheter inserted into blood vessel. A clamp, opened and closed by the nurse, is used to regulate the drip rates.

Microdrip – an apparatus for delivering relatively small measured amounts of IV solutions at specific flow rates over time, as when it is necessary to keep a vein open. The size of the drops is controlled by the fixed diameter of the plastic delivery tube. With a microdrip, 60 drops delivers 1 mL of solution.

Macro drip – a set that contains a needle and has various drip rates. 15 gtt/ml, 10 gtt/mL, 20gtt/mL, etc.

Infusion Pumps

Electric infusion pumps also deliver IV fluid. The nurse enters the total number of milliliters to be infused and the number of milliliters per hour.

Order: 600 mL D5W IV, run 60 mL/hr

The nurse enters 600 mL and 60 mL/hr

The pump automatically delivers 60mL/hr over the next 10 hours.

MAT 102 REVIEW

1. Ordered: Amitriptyline 50 mg po tid
Available: 25 mg tablets
How many tablets per dose of Amitriptyline will you give?
- 1a. Ordered: Nortriptyline 37.5 mg po qn
Available: 25 mg tablets
How many tablets of Nortriptyline will you give?
2. Ordered: Myambutol 1.2 g, po qd
Available: Myambutol 400 mg per tablet
How many tablets of Myambutol will you give?
- 2a. Ordered: Ascorbic Acid 250 mcg po bid
Available: Ascorbic Acid 0.5 mg tablets
How much will you give?
3. Ordered: Amoxicillin Oral Suspension 500 mg, po q8h
Available: Amoxicillin 125 mg/5 mL
How much Amoxicillin will you give per dose?
- 3a. Ordered: Azithromycin 100 mg, po, tid
Available: Azithromycin 200 mg/5mL suspension
How much will you give at each dose?
How much will you give for the whole day?
4. Ordered: Heparin 6,000 units SC q4h
Available: vial labeled 10,000 u/mL
How much will you give?
- 4a. Ordered: Kaon 7 mEq daily in 3 divided doses
Available: Kaon Liquid 20 mEq/15 mL
How much will you give?
5. Ordered: Isoproterenol HCl gr 1/300, IM, STAT
Available: Isoproterenol ampule labeled 1 mg per 5 mL
How much do you inject?
- 5a. Ordered: Morphine Sulfate gr 1/8 IM q4h prn for pain
Available: ampules labeled 10 mg per 1 mL
How many mL should you give?
6. Ordered: 1 oz of Nyquil
How many tbs would you give?

- 6a. Ordered: ½ oz Robitussin
How many tbs would you give?
7. Ordered: 450 mg of Kaopectate
Available: ½ teaspoon of Kaopectate is 125 mg
How many mL should you give?
- 7a. Ordered: 50 mg of Benadryl
Available: 1 teaspoon is 10 mg
How many mL should you give?
8. Ordered: Lanoxin 125 mcg IM
Available: Lanoxin 0.25 mg/2 mL ampule
How much will you give?
- 8a. Ordered: Cleocin 0.3 Gm IM q6h
Available: ampule 300 mg/2 mL
How many will you give?
9. Ordered: Amoxil 60 mg po q8h
Available: bottle of 125mg/5 mL
Child weighs 20 lbs. Literature states: children 40 mg/kg/day
Is the order safe?
How many much will you give?
- 9a. Ordered: Amoxicillin oral suspension 100 mg po q8h
Available: bottle labeled 125 mg/5mL
The baby weighs 15 kg. Literature states: 20 - 40 mg/kg/day in divided doses.
Is the dose safe?
How many mL should you give?
10. Ordered: Tetracycline Elixir qid for a child weighing 90 lbs at a dosage of 8 mg/kg/day
Available: Tetracycline 50 mg per 7 mL
How many mL should you give per dose? Per day?
- 10a. Ordered: Ampicillin IVPB for a child weighing 55 lbs at a dosage of 20 mg/kg/day in 3 equally divided doses
Available: Ampicillin 250 mg/1.5mL
How many mL should you give per dose? Per day?
11. Ordered: Quinidine for an adult patient weighing 110 lbs at a dosage of 25 mg/kg/day bid
Available: Quinidine 250 mg tablets
How many tablets per dose will you give?

- 11a. Ordered: 30 mg Trimox Amoxicillin per kg body mass per day
To be administered in three equally divided doses
Available: Trimox Amoxicillin 250 mg capsules
How many caps will a 165lb patient receive each day?
12. An IV of 1000 mL to infuse over 12 hr using a 20 gtt/mL set. What is the drip rate?
- 12a. A volume of 2500mL is to infuse in 22 hr on a 15 gtt/mL set. What is the drip rate?
13. A vial of 1 g aminophylline is added to 500 mL D5W IV. The order is to infuse at 75 mL/hr. How many mg/hr will the patient receive?
- 13a. A 10 mEq KCl was added to 200 mL D5W and infused at 8 mL/hr. Determine the hourly KCl rate.
14. An IV of 1000 mL was ordered to infuse in 8 hours. With 3 hours to infusion time left you discover that 600 mL have infused. The set delivers 20 gtt/mL. Recalculate the drip rate to deliver the fluid on time.
- 14a. A 50 mL piggyback IV is to infuse over 15 min. The set calibration is 15 gtt/mL. After 5 minutes the IV contains 40 mL. Calculate the flow rate to deliver the volume on time.
15. When you come on duty at 0800 hrs, there are 300 mL left in your patient's IV bag. It is infusing at 75 mL/hr. At what time do you need a new IV bag?
- 15a. 500 mL of D5Ns is ordered to run at 50 mL/hr. How many hours will this IV run?
16. Calculate the infusion time for an IV of 250 mL D5W infusing at 50 mL/hr.
- 16a. The doctor orders 1000 mL of penicillin G potassium. The administration set delivers 10gtt/mL and the flow rate is 21 gtt/min. How much time will it take to infuse the IV?
17. Heparin sodium 25,000 U in 250 mL D5W is order to infuse over 12 hours. What rate should you set the pump at?
- 17a. You are going to hang an IVPB. The medication is 500 mg of Vanocin. The volume is 100mL. The order is to infuse over 30 minutes. What rate should you set the pump?
18. An IV is running at 28 gtt/min using a set calibration of 10 gtt/mL. You are going to switch over to an infusion pump. What rate will you set the pump to keep the infusion running at the same rate?

- 18a. An IV is running at 56 gtt/min using a set calibration of 20 gtt/mL. You are going to switch over to an infusion pump. What rate will you set the pump to keep the infusion running at the same rate?
19. A solution of 2 g of Pronestyl is diluted in 200 mL D5W and will be delivered via an infusion pump in 45 min. What would be the flow rate?
- 19a. 8 mg of Levophed is ordered in 250 mL D5W and will be delivered via an infusion pump in 30 minutes. What would be the flow rate?
20. Ordered: An IV of D5W 100 mL with 10,000 U to 1 L D5W at 30 ml/hr
Calculate the units/hr the patient is receiving.
- 20a. Ordered: Infuse a solution of Heparin 20,000 U to 1 L D5W at 80 mL/hr
Calculate the units/hr the patient is receiving.
21. Ordered: 450 mg of Kefzol IM
Available: The medication comes in powder form.
The directions for reconstitution read:
"Add 2 mL sterile water for injection to yield 225mg/mL
How many mL would you draw up in the syringe for a dose?
- 21a. Ordered: 125 mg of Methylprednisolone IM
Available: The directions read:
"Reconstitute with 8.0 bacteriostatic water for injection yielding
632.5 mg per mL."
How many mL would you draw up in the syringe for a dose?
22. Ordered: Demerol 25 mg and Phenergan 12.5 mg IM prn for pain
Available: Demerol 50 mg/mL and Phenergan 25mg/mL
What is the total volume to be given?
- 22a. Ordered: Demerol 20 mg and Vistaril 10mg IM
Available: Demerol 50 mg/mL and Vistaril 75mg/3mL
What is the total volume to be given?

| | |
|--|-----------------------|
| PENICILLIN G POTASSIUM for injection | |
| Preparation of Solutions | |
| Use sterile water for injection | |
| RECONSTITUTION | |
| 1,000,000 u vial | |
| Diluent | Desired Concentration |
| 9.6 mL | 100,000 u/mL |
| 4.5 mL | 200,000 u/mL 3.5 |
| 3.5mL | 250,000 u/mL |
| 5,000,000 u vial | |
| Diluent | Desired Concentration |
| 23 mL | 200,000 u/mL |
| 18 mL | 250,000 u/mL |
| 8mL | 1,000,000 u/mL |
| 3 mL | |
| Storage | |
| Prepared solutions may be kept in the refrigerator one week. | |

23. Ordered: Penicillin G Potassium 1,000,000 units every 6 hours.
 How much diluent will you add?
 How many mLs will you give?

24. Ordered: Zithromax 400 mg every 6 hours
 How much water will you add?
 What is the dosage strength of the solution?
 How many mLs will you give at each dose?

| | | | | |
|---|-------------------------------|-----------------|------------------------|--|
| AMPICILLIN | | | | |
| Reconstitution | | | | |
| Dissolve contents of a vial with the amount Sterile Water of Bacteriostatic Water | | | | |
| Amount Ordered | Recommended Amount of Diluent | Withdraw Volume | Concentration in mg/mL | |
| 500 mg | 1.8 mL | 2.0 mL | 250 mg | |
| 1.0 Gram | 3.4 mL | 4.0 mL | 250 mg | |
| 2.0 gram | 6.8 mL | 8.0 mL | 250 mg | |
| Storage | | | | |
| Use within one hour of reconstitution | | | | |

25. Ordered: Ampicillin 500 mg every 8 hours
 How much diluent will you add?
 How many mLs will you give?

For Question #26**CEFTAZIDIME INJECTION**

Reconstitution

Single dose vials: Reconstitute with sterile water, Shake well.

| Vial Size | Diluent | Approx. Avail. Volume | Approx. Avg. Concentration |
|---------------------------------|---------|-----------------------|----------------------------|
| <u>IM or IV Bolus injection</u> | | | |
| 1 gram | 3.0 mL | 3.6mL | 280 mg/mL |
| <u>IV infusion</u> | | | |
| 1 gram | 10 mL | 10.6mL | 95 mg/mL |
| 2 gram | 10 mL | 11.2mL | 180 mg/mL |

Stable for 18 hours at room temperature or seven days if refrigerated.

For Question #27**RECONSTITUTION**

Preparation of Parenteral Solution

Parenteral drug products should be **SHAKEN WELL** when reconstituted, and inspected visually for particulate matter prior to administration. If particulate matter is evident in reconstituted fluids, the drug solutions should be discarded. When reconstituted or diluted according to the instructions below, Ancef (sterile cefazolin sodium, SK&F) is stable for 24 hours at room temperature or for 96 hours if stored under refrigeration. Reconstituted solutions may range in color from pale yellow to yellow without change in potency.

Single-Dose Vials

For IM, injection, I.V direct (bolus) injection, or I.V. infusion, reconstitute with Sterile Water for injection according to the following table

| <i>Vial Size</i> | <i>Amount of Diluent</i> | <i>Approximate Concentration</i> | <i>Approximate Available Volume</i> |
|------------------|--------------------------|----------------------------------|-------------------------------------|
| 250 mg | 2.0 mL | 125 mg/mL | 2.0 mL |
| 500 mg | 2.0 mL | 225 mg/mL | 2.2 mL |
| 1 gram | 2.5 mL | 330 mg/mL | 3.0 mL |

Amt. Diluent Type Diluent Strength Potency

26. 1g IM

27. 500mg IM

MAT 102 Review Solutions

1. $\frac{25 \text{ mg}}{1 \text{ tab}} = \frac{50 \text{ mg}}{x \text{ tab}} \quad \frac{25x}{25} = \frac{50}{25} \quad x = 2 \text{ tablets}$
- 1a. $\frac{25 \text{ mg}}{1 \text{ tab}} = \frac{37.5 \text{ mg}}{x \text{ tab}} \quad \frac{25x}{25} = \frac{37.5}{25} \quad x = 1\frac{1}{2} \text{ tablets}$
2. $1.2\text{g} = 1200 \text{ mg} \quad \frac{400\text{mg}}{1 \text{ tab}} = \frac{1200 \text{ mg}}{x \text{ tab}} \quad \frac{400x}{400} = \frac{1200}{400} \quad x = 3 \text{ tablets}$
- 2a. $0.5 \text{ mg} = 500 \text{ mcg} \quad \frac{500\text{mcg}}{1 \text{ tab}} = \frac{250 \text{ mg}}{x \text{ tab}} \quad \frac{500x}{500} = \frac{250}{500} \quad x = 0.5 \text{ tab} = \frac{1}{2} \text{ tablets}$
3. $\frac{125 \text{ mg}}{5 \text{ mL}} = \frac{500 \text{ mg}}{x \text{ mL}} \quad \frac{25x}{25} = \frac{500}{25} \quad x = 20 \text{ mL}$
- 3a. $\frac{200 \text{ mg}}{5 \text{ mL}} = \frac{100 \text{ mg}}{x \text{ mL}} \quad \frac{40x}{40} = \frac{100}{40} \quad x = \frac{5}{2} \text{ mL} = 2.5 \text{ mL per dose} \quad 2.5 \times 3 = 7.5\text{mL per day}$
4. $\frac{10,000\text{U}}{1\text{mL}} = \frac{6000\text{U}}{x\text{mL}} \quad \frac{10,000}{10,000} = \frac{6000}{10,000} \quad x = 0.6 \text{ mL per dose}$
- 4a. $\frac{20 \text{ mEq}}{15 \text{ mL}} = \frac{7 \text{ mEq}}{x \text{ mL}} \quad \frac{20x}{20} = \frac{105}{20} \quad x = 5.25 \frac{\text{mL}}{\text{day}} \approx 5.3 \frac{\text{mL}}{\text{day}} \quad 1.75 \frac{\text{mL}}{\text{dose}} \approx 1.8 \frac{\text{mL}}{\text{dose}}$
5. $\frac{\text{gr } 1}{60 \text{ mg}} = \frac{\text{gr } 1/300}{x \text{ mg}} \quad x = \frac{1}{300} \times \frac{60}{x} \quad x = \frac{1}{5} \text{ mg} = 0.2 \text{ mg}$
- $\frac{1 \text{ mg}}{5\text{mL}} = \frac{0.2 \text{ mg}}{x \text{ mL}} \quad x = 1 \text{ mL}$
- 5a. $\frac{\text{gr } 1}{60 \text{ mg}} = \frac{\text{gr } 1/8}{x \text{ mg}} \quad x = 7.5 \text{ mg} \quad \frac{10 \text{ mg}}{1 \text{ mL}} = \frac{7.5 \text{ mg}}{x \text{ mL}} \quad \frac{10x}{10} = \frac{7.5}{10} \quad x = 0.75\text{mL}$
6. $1\text{oz} = 30 \text{ mL} \quad \frac{1 \text{ tbs}}{15 \text{ mL}} = \frac{x \text{ tbs}}{30 \text{ mL}} \quad \frac{15x}{15} = \frac{30}{15} \quad x = 2 \text{ tbs}$
- 6a. $\frac{1 \text{ oz}}{30 \text{ mL}} = \frac{\frac{1}{2} \text{ oz}}{x \text{ mL}} \quad x = 15 \text{ mL} \quad 1 \text{ tbs} = 15 \text{ mL} \quad x = 1 \text{ tbs}$
7. $\frac{1 \text{ tsp}}{5 \text{ mL}} = \frac{1/2 \text{ tbs}}{x \text{ mL}} \quad x = 2.5 \text{ mL} \quad \frac{2.5 \text{ mL}}{125 \text{ mg}} = \frac{x \text{ mL}}{450 \text{ mg}} \quad \frac{125x}{125} = \frac{1125}{125} \quad x = 9 \text{ mL}$
- 7a. $1 \text{ tsp} = 5 \text{ mL} \quad \frac{5 \text{ mL}}{10 \text{ mg}} = \frac{x \text{ mL}}{50 \text{ mg}} \quad \frac{10x}{10} = \frac{125}{10} \quad x = 25 \text{ mL}$

$$8. \quad 0.25 \text{ mg} = 250 \text{ mcg} \quad \frac{250 \text{ mcg}}{2 \text{ mL}} = \frac{125 \text{ mcg}}{x \text{ mL}} \quad \frac{125x}{125} = \frac{125}{125} \quad x = 1 \text{ mL}$$

$$8a. \quad 0.3 \text{ Gm} = 300 \text{ mg} \quad \frac{300 \text{ mg}}{2 \text{ mL}} = \frac{300 \text{ mg}}{x \text{ mL}} \quad x = 2 \text{ mL}$$

$$9. \quad \frac{1 \text{ kg}}{2.2 \text{ lbs}} = \frac{x \text{ kg}}{20 \text{ lbs}} \quad \frac{2.2x}{2.2} = \frac{20}{2.2} \quad x \approx 9 \text{ mL} \quad 60 \times 3 = 180 \frac{\text{mg}}{\text{day}} \text{ ordered}$$

The order is two low $\frac{40 \text{ mg}}{1 \text{ kg}} = \frac{x \text{ mg}}{15 \text{ kg}} \quad x = 360 \text{ mg/day}$

$$9a. \quad \frac{20 \text{ mg}}{1 \text{ kg}} = \frac{x \text{ mg}}{15 \text{ kg}} \quad x = 300 \text{ mg low dose/day} \quad \frac{40 \text{ mg}}{1 \text{ kg}} = \frac{x \text{ mg}}{15 \text{ kg}} \quad x = 600 \text{ mg high dose/day}$$

$$100 \times 3 = 300 \frac{\text{mg}}{\text{day}} \text{ is safe} \quad \frac{125 \text{ mg}}{5 \text{ mL}} = \frac{300 \text{ mg}}{x \text{ mL}} \quad \frac{25x}{25} = \frac{300}{25} \quad x = 12 \frac{\text{mL}}{\text{day}} \quad 12 \div 3 = 4 \text{ mL/dose}$$

$$10. \quad \frac{1 \text{ kg}}{2.2 \text{ lbs}} = \frac{x \text{ kg}}{90 \text{ lbs}} \quad \frac{2.2x}{2.2} = \frac{90}{2.2} \quad x \approx 41 \text{ kg} \quad \frac{8 \text{ mg}}{1 \text{ kg}} = \frac{x \text{ mg}}{41 \text{ kg}} \quad x = 328 \text{ mg}$$

$$\frac{50 \text{ mg}}{7 \text{ mL}} = \frac{328 \text{ mg}}{x \text{ mL}} \quad \frac{50x}{50} = \frac{2296}{250} \quad x \approx 46 \frac{\text{mL}}{\text{day}} \quad 46 \div 4 \approx 12 \text{ mL/dose}$$

$$10a. \quad \frac{1 \text{ kg}}{2.2 \text{ lbs}} = \frac{x \text{ kg}}{55 \text{ lbs}} \quad \frac{2.2x}{2.2} = \frac{55}{2.2} \quad x \approx 25 \text{ kg} \quad \frac{20 \text{ mg}}{1 \text{ kg}} = \frac{x \text{ mg}}{25 \text{ kg}} \quad x = 500 \frac{\text{mg}}{\text{day}}$$

$$\frac{250 \text{ mg}}{1.5 \text{ mL}} = \frac{500 \text{ mg}}{x \text{ mL}} \quad \frac{250x}{250} = \frac{750}{250} \quad x = \frac{3 \text{ mL}}{\text{day}} \quad 3 \div 3 = 1 \text{ mL/dose}$$

$$11. \quad \frac{1 \text{ kg}}{2.2 \text{ lbs}} = \frac{x \text{ kg}}{110 \text{ lbs}} \quad \frac{2.2x}{2.2} = \frac{110}{2.2} \quad x = 50 \text{ kg} \quad \frac{25 \text{ mg}}{1 \text{ kg}} = \frac{x \text{ mg}}{50 \text{ kg}} \quad x = 1250 \text{ mg}$$

$$\frac{250 \text{ mg}}{1 \text{ tab}} = \frac{1250 \text{ mg}}{x \text{ tab}} \quad \frac{250x}{250} = \frac{1250}{250} \quad x = 5 \frac{\text{tabs}}{\text{day}} \quad 5 \div 2 = 2.5 \text{ tabs}$$

$$11a. \quad \frac{1 \text{ kg}}{2.2 \text{ lbs}} = \frac{x \text{ kg}}{165 \text{ lbs}} \quad \frac{2.2x}{2.2} = \frac{165}{2.2} \quad x = 75 \text{ kg} \quad \frac{30 \text{ mg}}{1 \text{ kg}} = \frac{x \text{ mg}}{75 \text{ kg}} \quad x = 2250 \text{ mg}$$

$$\frac{250 \text{ mg}}{1 \text{ cap}} = \frac{2250 \text{ mg}}{x \text{ cap}} \quad \frac{250x}{250} = \frac{2250}{250} \quad x = 9 \text{ caps/day}$$

$$12. \quad \frac{20 \text{ gtt}}{1 \text{ mL}} = \frac{x \text{ gtt}}{1000 \text{ mL}} \quad x = 20,000 \text{ gtt} \quad 12 \text{ hrs} = (12 \times 60) = 720 \text{ min}$$

$$\frac{20,000 \text{ gtt}}{720 \text{ min}} = \frac{x \text{ gtt}}{1 \text{ min}} \quad \frac{72x}{72} = \frac{2000}{72} \quad x \approx 28 \text{ gtt/min}$$

$$12a. \quad \frac{15 \text{ gtt}}{1 \text{ mL}} = \frac{x \text{ gtt}}{2500 \text{ mL}} \quad x = 37,500 \text{ gtt} \quad 22 \text{ hrs} = (22 \times 60) = 1320 \text{ min}$$

$$\frac{37,500 \text{ gtt}}{1320 \text{ min}} = \frac{x \text{ gtt}}{1 \text{ min}} \quad \frac{132x}{132} = \frac{3750}{132} \quad x \approx 28 \text{ gtt/min}$$

$$13. \quad 1\text{g} = 1000 \text{ mg} \quad \frac{1000 \text{ mg}}{500 \text{ mL}} = \frac{x \text{ mg}}{75 \text{ mL}} \quad x = 150 \text{ mg/hr}$$

$$13a. \quad \frac{10 \text{ mEq}}{200 \text{ mL}} = \frac{x \text{ mEq}}{8 \text{ mL}} \quad \frac{20x}{20} = \frac{8}{20} \quad x = 0.4 \text{ mEq/hr}$$

$$14. \quad \frac{20 \text{ gtt}}{1 \text{ mL}} = \frac{x \text{ gtt}}{400 \text{ mL}} \quad x = 8000 \text{ gtt} \quad 3\text{hrs} \times 60 \text{ min} = 180 \text{ min}$$

$$\frac{8000 \text{ gtt}}{180 \text{ min}} = \frac{x \text{ gtt}}{1 \text{ min}} \quad \frac{180x}{180} = \frac{8000}{180} \quad x \approx 44 \text{ gtt/min}$$

$$14a. \quad \frac{15 \text{ gtt}}{1 \text{ mL}} = \frac{x \text{ gtt}}{40 \text{ mL}} \quad x = 600 \text{ gtt} \quad \frac{600 \text{ gtt}}{10 \text{ min}} = \frac{x \text{ gtt}}{1 \text{ min}} \quad \frac{10x}{10} = \frac{600}{10} \quad x = 60 \text{ gtt/min}$$

$$15. \quad \frac{75 \text{ mL}}{1 \text{ hr}} = \frac{300 \text{ mL}}{x \text{ hr}} \quad \frac{75x}{75} = \frac{300}{25} \quad x = 4 \text{ hrs} \quad 0800 + 4 \text{ hrs} = 1200$$

$$15a. \quad \frac{50 \text{ mL}}{1 \text{ hr}} = \frac{500 \text{ mL}}{x \text{ hr}} \quad \frac{50x}{50} = \frac{500}{50} \quad x = 10 \text{ hrs}$$

$$16. \quad \frac{50 \text{ mL}}{1 \text{ hr}} = \frac{250 \text{ mL}}{x \text{ hr}} \quad \frac{50x}{50} = \frac{250}{50} \quad x = 5 \text{ hrs}$$

$$16a. \quad \frac{10 \text{ gtt}}{1 \text{ mL}} = \frac{x \text{ gtt}}{1000 \text{ mL}} \quad x = 10000 \text{ gtt} \quad \frac{21 \text{ gtt}}{1 \text{ min}} = \frac{10000 \text{ gtt}}{x \text{ min}} \quad \frac{21x}{21} = \frac{10000}{21} \quad x = 476 \text{ min} \approx 8 \text{ hrs}$$

$$17. \quad \frac{250 \text{ mL}}{12 \text{ hrs}} = \frac{x \text{ mL}}{1 \text{ hr}} \quad \frac{12x}{12} = \frac{250}{12} \quad x \approx 21 \text{ mL/hr}$$

$$17a. \quad \frac{100 \text{ mL}}{30 \text{ min}} = \frac{x \text{ mL}}{60 \text{ min}} \quad \frac{30x}{30} = \frac{6000}{30} \quad x = 200 \text{ mL/hr}$$

$$18. \quad \frac{10 \text{ gtt}}{1 \text{ mL}} = \frac{28 \text{ gtt}}{x \text{ mL}} \quad \frac{10x}{10} = \frac{28}{10} \quad x = 2.8 \text{ mL/min} \quad \frac{2.8 \text{ mL}}{1 \text{ min}} = \frac{x \text{ mL}}{60 \text{ min}} \quad x = 168 \text{ mL/hr}$$

$$18a. \quad \frac{20 \text{ gtt}}{1 \text{ mL}} = \frac{56 \text{ gtt}}{x \text{ mL}} \quad \frac{20x}{20} = \frac{56}{20} \quad x = 2.8 \text{ mL/min} \quad \frac{2.8 \text{ mL}}{1 \text{ min}} = \frac{x \text{ mL}}{60 \text{ min}} \quad x = 168 \text{ mL/hr}$$

$$19. \quad \frac{200 \text{ mL}}{45 \text{ min}} = \frac{x \text{ mL}}{60 \text{ min}} \quad \frac{45x}{45} = \frac{12000}{45} \quad x \approx 267 \text{ mL/hr}$$

$$19a. \quad \frac{250 \text{ mL}}{30 \text{ min}} = \frac{x \text{ mL}}{60 \text{ min}} \quad \frac{30x}{30} = \frac{15000}{30} \quad x = 500 \text{ mL/hr}$$

$$20. \quad \frac{100 \text{ mL}}{10000 \text{ U}} = \frac{30 \text{ mL}}{x \text{ U}} \quad \frac{100x}{100} = \frac{300000}{100} \quad x = 3000 \text{ U/hr}$$

$$20a. \quad 1\text{L} = 1000 \text{ mL} \quad \frac{20000 \text{ U}}{1000 \text{ mL}} = \frac{x \text{ U}}{80 \text{ mL}} \quad \frac{1000x}{1000} = \frac{1600000}{1000} \quad x = 1600 \text{ U/hr}$$

$$21. \quad \frac{225 \text{ mg}}{1 \text{ mL}} = \frac{450 \text{ mL}}{x \text{ mL}} \quad \frac{225x}{225} = \frac{450}{225} \quad x = 2 \text{ mL}$$

$$21a. \quad \frac{632.5 \text{ mg}}{1 \text{ mL}} = \frac{125 \text{ mg}}{x \text{ mL}} \quad \frac{632.5x}{632.5} = \frac{125}{632.5} \quad x \approx 0.2 \text{ mL}$$

$$22. \quad \frac{50 \text{ mg}}{1 \text{ mL}} = \frac{25 \text{ mg}}{x \text{ mL}} \quad \frac{50x}{50} = \frac{25}{50} \quad x = 0.5 \text{ mL Demerol}$$

$$\frac{25 \text{ mg}}{1 \text{ mL}} = \frac{12.5 \text{ mg}}{x \text{ mL}} \quad \frac{25x}{25} = \frac{12.5}{25} \quad x = 0.5 \text{ mL Phenegran} \quad 0.5 + 0.5 = 1.0 \text{ mL total volume}$$

$$22a. \quad \frac{50 \text{ mg}}{1 \text{ mL}} = \frac{20 \text{ mg}}{x \text{ mL}} \quad \frac{50x}{50} = \frac{20}{50} \quad x = 0.4 \text{ mL Demerol}$$

$$\frac{75 \text{ mg}}{3 \text{ mL}} = \frac{10 \text{ mg}}{x \text{ mL}} \quad \frac{75x}{75} = \frac{30}{75} \quad x = 0.4 \text{ mL Vistaril} \quad 0.4 + 0.4 = 0.8 \text{ mL total volume}$$

$$23. \quad 9.6 \text{ mL dilute} \quad \frac{100,000 \text{ U}}{1\text{mL}} = \frac{1,000,000 \text{ U}}{x \text{ mL}} \quad \frac{100,000x}{100,000} = \frac{1,000,000}{100,000} \quad x = 10 \text{ mL}$$

$$4.6 \text{ mL dilute} \quad \frac{200,000 \text{ U}}{1\text{mL}} = \frac{1,000,000 \text{ U}}{x \text{ mL}} \quad \frac{200,000x}{200,000} = \frac{1,000,000}{200,000} \quad x = 5 \text{ mL}$$

$$3.6 \text{ mL dilute} \quad \frac{250,000 \text{ U}}{1\text{mL}} = \frac{1,000,000 \text{ U}}{x \text{ mL}} \quad \frac{250,000x}{250,000} = \frac{1,000,000}{250,000} \quad x = 4 \text{ mL}$$

24. Water to add: 15 mL to the bottle; Dosage strength: 200mg/5 mL

$$\frac{200 \text{ mg}}{5 \text{ mL}} = \frac{400 \text{ mg}}{x \text{ mL}} \quad \frac{40x}{40} = \frac{400}{40} \quad x = 10 \text{ mL}$$

$$25. \quad \begin{array}{llll} \text{Add 1.8mL of diluent} & \frac{250 \text{ mg}}{1 \text{ mL}} = \frac{500 \text{ mg}}{x \text{ mL}} & \frac{250x}{250} = \frac{500}{250} & x = 2 \text{ mL} \\ \text{Amt. Diluent} & \text{Type Diluent} & \text{Strength} & \text{Potency} \end{array}$$

| | | | | |
|-----|------|---------------|-------------|--|
| 26. | 3 mL | Sterile water | 280 mg/1 mL | 18 hrs room temp., 7 days ref. |
| 27. | 2 mL | Sterile water | 225 mg/1 mL | 24 hrs room temp; 96 hrs ref; 30 weeks frozen |