

Borough of Manhattan Community College Department of Mathematics

MAT 104 DEPARTMENTAL FINAL EXAM REVIEW

Directions: Show all work. You may not use a calculator on the actual exam.

PART I. ARITHMETIC REVIEW

1. Simplify: $\frac{0.08}{0.1} * \frac{2.1}{1}$
2. If you have medication tablets whose strength is 0.1 mg and you need to give 0.3 mg, you will need (select one):
 - a) 1 tab;
 - b) less than 1 tab;
 - c) more than 1 tab.
3. Clear decimals, reduce fractions, then calculate. Round your answer to the nearest whole number: $\frac{1}{0.02} \times \frac{0.4}{1.6}$
4. How many milligrams is $\frac{1}{3}$ of a 300 mg-tablet?

PART II. CONVERSIONS

1. Perform the following conversions.
 - a) 39 Lb 4 Oz _____ kg; round your answer to the nearest tenth;
 - b) 0.2 g _____ mg;
 - c) 27 kg _____ Lb; round your answer to the nearest tenth;
 - d) 16 mcg _____ mg;
 - e) 3 tbs _____ mL;
 - f) 75 mL _____ Oz.
2. A nurse encouraged a client with diarrhea to drink 40 Oz of water per day. How many cups does this represent?
3. Convert 98.6 degrees Fahrenheit to Celsius.
4. A client weighs 99.2 kg. How many pounds does the client weigh? Round to the nearest tenth.
5. Convert 38.2 degrees Celsius to Fahrenheit.
6. An IV therapy started at 11:50 PM with an infusion time of 3 hr 30 min, what was the completion time in standard time?
7. If a client had IV therapy for 8 hours, ending at 1100, when on the 24-hour clock was the IV started?
8. A client had the following for lunch. Calculate client's fluid intake in mL.
 $\frac{1}{2}$ cup of grape juice, 6 Oz of applesauce, $\frac{3}{4}$ Lb of fish sandwich, 1 $\frac{1}{2}$ cups of water.

PART III. READING MEDICATION LABELS

1. Read the label, and identify the information requested:

851210 NDC 0026-8512-51

CIPRO®
(ciprofloxacin hydrochloride/Miles)
Equivalent to
250 mg ciprofloxacin
100 Tablets

Caution: Federal (USA) law prohibits dispensing without a prescription.

NOW! Tablets Marked "CIPRO" and "250"

Miles Inc. Pharmaceutical Division
400 Morgan Lane
West Haven, CT 06516

DESCRIPTION: Each tablet contains ciprofloxacin hydrochloride equivalent to 250 mg of ciprofloxacin.

DOSAGE: See accompanying literature for complete information on dosage and administration.

RECOMMENDED STORAGE: Store below 86°F (30°C).

Label (i)

- Trade Name: _____
- Generic Name: _____
- Form: _____
- Dosage strength: _____
- Total in Container: _____

120 Tablets Rx only
NDC 0025-1451-20

Cytotec®
(misoprostol)
100 mcg

Usual Adult Dosage:
See accompanying literature.

SEARLE

CONTRAINDICATION/WARNING: Do not take if you are pregnant, planning to get pregnant, or breastfeeding. Misoprostol causes uterine contractions which may lead to miscarriage or abortion. Do not take if you are allergic to misoprostol or any of the ingredients. See accompanying literature for complete information.

Store at or below 25°C (77°F), in a dry area.

Pharmacist: Dispense in this unit-of-use, child-resistant container with Patient Leaflet attached.
Mfg. by Searle & Co., San Juan PR 00936
Mfg. by Searle, Morpeth, England
For G.D. Searle & Co., Chicago IL 60680 USA

Label (ii)

- Trade Name: _____
- Generic Name: _____
- Form: _____
- Dosage strength: _____
- Total Volume: _____

NDC 0641-2341-41

Hydromorphone
HCl Injection, USP

40 mg/20 mL (2 mg/mL)
FOR SUBCUTANEOUS,
INTRAMUSCULAR OR
SLOW INTRAVENOUS USE
20 mL Rx only
Multiple Dose Vial

Manufactured by:
WEST-WARD
Eatontown, NJ 07724 USA

DO NOT USE IF PRECIPITATED

Usual Dosage: See package insert for complete prescribing information.

Store at 20°-25°C (68°-77°F) [See USP Controlled Room Temperature].

PROTECT FROM LIGHT
Keep covered in carton for duration of use.

462-258-02

Each mL contains hydromorphone hydrochloride 2 mg, edetate disodium 0.5 mg, methylparaben 1.8 mg and propylparaben 0.2 mg in Water for Injection, pH 3.5-5.5; sodium hydroxide and/or hydrochloric acid added, if needed, for pH adjustment.

Label (iii)

- Trade Name: _____
- Generic Name: _____
- Form: _____
- Dosage strength: _____
- Total Volume: _____
- Directions for use _____

NDC 61442-102-60

Diclofenac Sodium
Delayed-Release Tablets USP

50 mg

PHARMACIST: PLEASE DISPENSE WITH MEDICATION GUIDE

Rx Only
Carlsbad Technology, Inc.
60 Tablets

Manufactured and Distributed by:
Carlsbad Technology, Inc.
5825 Balboa Ct. Carlsbad, CA 92008 USA

Lot: _____
Exp: _____

Each delayed-release tablet contains: Diclofenac Sodium USP, 50 mg

Usual dosage: See insert for full prescribing information

Dispense in a tight, light-resistant container as defined in the USP.

Store at 20° to 25°C (68° to 77°F) [See USP Controlled Room Temperature]. Protect from moisture.

Keep this and all medication out of the reach of children.

Rev. 09/15

Label (iv)

- Trade Name: _____
- Generic Name: _____
- Dosage strength: _____
- Is it safe to store this medication in a freezer? Justify. _____

2. The medication with the label below is shipped in powdered form.

How much diluent is needed for reconstitution?

Usual Dosage - 125 or 250 mg every 6 to 8 hours. See package insert.

Dispensing Directions - Prepare solution at the time of dispensing by adding a total of 127 mL water in two portions to the bottle as follows: Loosen powder by tapping the bottle, add about half the water, and shake well. Add the remaining water and shake well to complete solution. This provides 200 mL of solution.

Manufactured for:
DAVA Pharmaceuticals, Inc.
 Fort Lee, NJ 07024, USA
 by:
Suir Pharma Ireland Ltd.
 Clonmel, Ireland.

Rev. 03/2014 92416011403

200 mL bottle Rx only

DAVA

3. Using Corvert label, answer the following questions:

- What is the total volume of the vial?
- What is the dosage strength?
- What is the route of administration?

Store at controlled room temperature 20° to 25°C (68° to 77°F) [see USP].

DOSAGE AND USE:
 See accompanying prescribing information.

Each mL contains ibutilide fumarate, 0.1 mg. Also contains sodium chloride, 8.90 mg; sodium acetate trihydrate, 0.189 mg; water for injection. When necessary, pH was adjusted with sodium hydroxide and/or hydrochloric acid.

Distributed by Pharmacia & Upjohn Co
 Division of Pfizer Inc, NY, NY 10017

10 mL Single-Dose Vial
Corvert®
 (ibutilide fumarate injection)
1 mg/10 mL
 (0.1 mg/mL)
 For IV use only

NDC 0009-3794-01

Pfizer Injectables Rx only

LOT / EXP
 PA A042724

PART IV. DOSAGE CALCULATIONS

1. Calculate the following dosage:

Order: Glucophage 0.5 g p.o. b.i.d.

Available:

100 Tablets NDC 0087-6060-05

GLUCOPHAGE®
 (metformin hydrochloride)
 Tablets

500 mg

Bristol-Myers Squibb

Store at 20°-25° C (68°-77° F); excursions permitted to 15°-30° C (59°-86° F). [see USP Controlled Room Temperature]. Glucophage® is a registered trademark of Merck KGaA, S.A.S., an associate of Merck KGaA of Darmstadt, Germany. Licensed to Bristol-Myers Squibb Company. Distributed by Bristol-Myers Squibb Company, Princeton, NJ 08543 USA

2. Order: Xanax 500 mcg p.o. t.i.d. Available:

How many tablets will be needed for one dose?

Rx only

See package insert for complete product information.

Keep container tightly closed.

Dispense in tight, light-resistant container.

Store at controlled room temperature 20° to 25° C (68° to 77° F) [see USPI].

Xanax®
 alprazolam tablets,
 USP

0.25 mg

100 Tablets

Pharmacia & Upjohn Company
 Kalamazoo, MI 49001, USA

NDC 0009-0029-01
 6505-01-143-9269

3. Order: Phenobarbital 90 mg p.o. at bedtime.

Available: Phenobarbital 15 mg tablets and 30 mg tablets.

a) Which strength tablet is best to administer?

b) How many tablets of which strength will you prepare to administer?

c) State why.

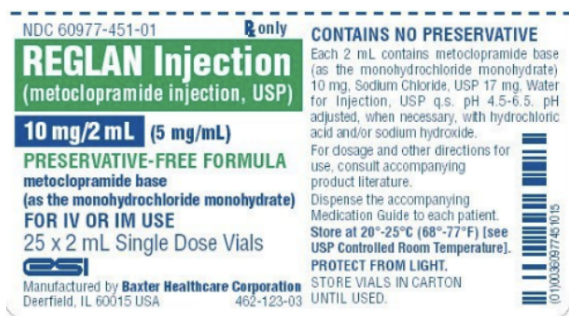
4. Order: Augmentin 0.25 g p.o. q8h

Available:



5. Order: Reglan 5 mg IM b.i.d. $\frac{1}{2}$ hour a.c.

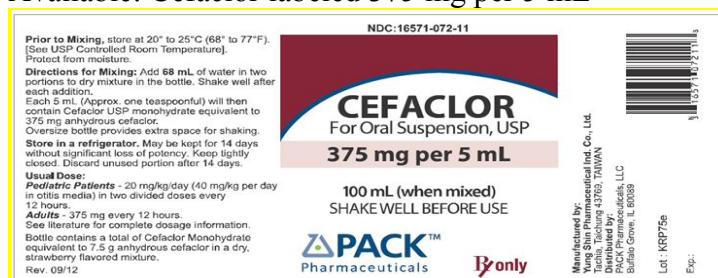
Available:



6. Calculate the following dosage:

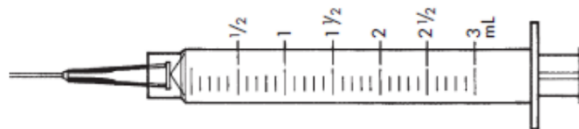
Order: Cefaclor 0.18 g p.o. q4h

Available: Cefaclor labeled 375 mg per 5 mL



7. Order: Penicillin G potassium 300,000 units IV q6h.

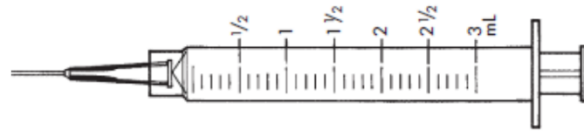
- Which dosage strength would be appropriate to use?
- How many milliliters of diluent will you add to receive the dosage strength in (a)?
- How many milliliters will you administer?
- Shade the dosage calculated on the syringe provided.



8. Order: Penicillin G potassium 700,000 units IV q6h.

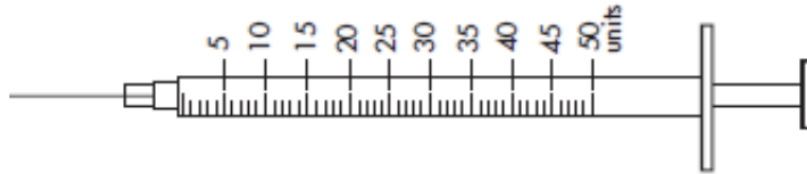
- Which dosage strength would be appropriate to use?
- How many milliliters of diluent will you add to receive the dosage strength in (a)?

- c) How many milliliters will you administer?
- d) Shade the dosage calculated on the syringe provided.

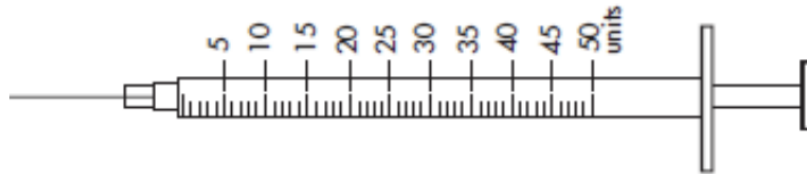


9. Shade on the syringe:

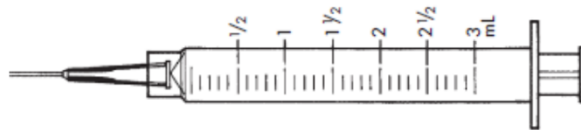
Order: Novolin R U-100 41 units subcut subcut daily at 7:30 am.



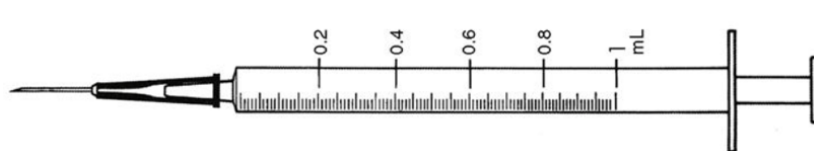
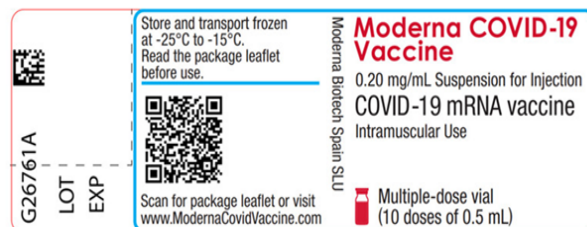
10. Use the syringe calibrations provided to measure the dosage 22 units of regular insulin.



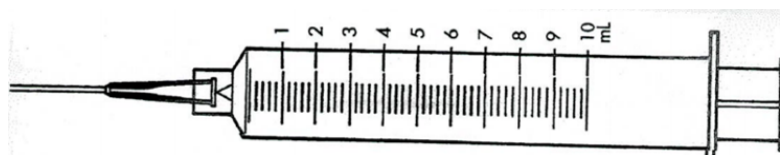
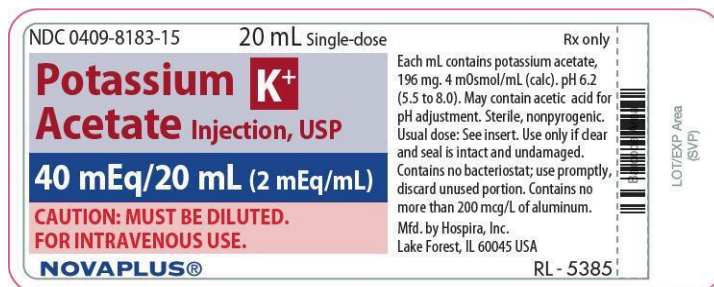
11. Prepare a 0.3 g dosage from medication labeled 900 mg per 6 mL. Show the amount of medication on the syringe.



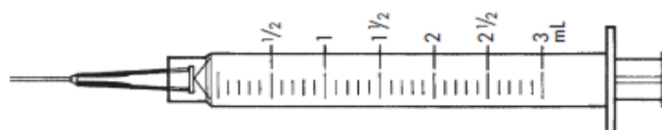
12. According to the instructions on the Moderna Covid-19 mRNA vaccine, a health worker has to fill a syringe with 0.5 mL of the medicine. You have a 1 mL syringe. How many mL do you need to fill the syringe with?



13. Order: Potassium acetate 16 mEq for IV. Calculate the dosage in mL to the nearest hundredth. Shade the dosage on the syringe provided.



14. Order: Cyanocobalamin 800 mcg. Calculate the dosage in mL. Shade the dosage on the syringe provided.



15. Order: Biaxin 1 g p.o. daily. How many tablets do you give?

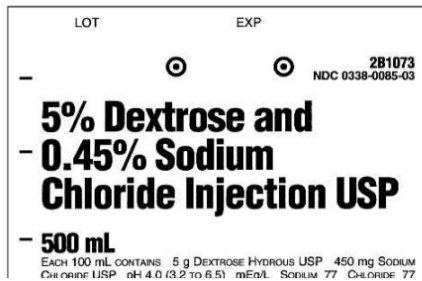


16. You are to administer 3 tablets with a dosage strength of 0.04 mg each. What is the total dosage you need to administer?

17. Order: $\frac{1}{3}$ - strength Ensure 1200 mL by NG tube over 8 hours. Calculate the amount of solute and solvent needed.

PART V. INTRAVENOUS (IV) CALCULATIONS

1. Use the label below to answer the following questions:



- a) What is the abbreviation for the given IV fluid? _____
- b) Calculate the amount of dextrose in the given IV fluid. _____
- c) Calculate the amount of sodium chloride in the given IV fluid. _____

2. Calculate the amount of dextrose and sodium chloride in 1000 mL of 5% dextrose and 0.9% normal saline.

3. Order: Lactated Ringer solution 1,000 mL to infuse at 80 mL/hr. The administration set delivers 15 gtt/mL. At what rate in gtt/min should the IV infuse?

4. An IV of 500 mL NS is to infuse at 60 mL/hr.

- a) Determine the infusion time expressed in traditional time (12-hour clock). _____
- b) The IV was started at 10: 00 PM. When would the IV infusion be completed? State time in (i) traditional (12-hour clock) and (ii) military (24-hour clock) time . _____

5. An IV of 500 mL of 0.9% NS is to infuse in 6 hr at a rate of 14gtt/min (14 macrogtt/min). Drop factor: 10 gtt/ mL. The IV was started at 7 AM. You check the IV at 8 AM, and 200 mL has infused.

a) Recalculate the rate in gtt/min for the remaining solution. _____

b) Determine the percentage of change. _____

c) State your course of action. _____

6. Order: 1 L of 0.9 % NS with 40,000 units heparin over 24 hours. Calculate the following:

a) mL/hr

b) units/hr

7. A dosage of 40 mg in 4 mL is diluted to 50 mL and administered in 90 minutes. Determine: (a) the number of diluent to be added and (b) the flow rate in mL/hr to set the pump.

8. A solution of 40,000 units in 1000 mL of heparin is to be used to infuse 1500 units/hr, calculate flow rate in mL/hr of the heparin. Round your answer to a whole number.

9. A solution of 400 mg in 250 mL and to infuse at 45 mL/hr. Calculate (a) mg/hr and (b) the mcg/min to infuse.

10. An infusion of 250 mL is started at 12: 20 pm to infuse at a rate of 20 mL/hr. Calculate (a) the infusion time and give the answer in hr and min; (b) the completion time using a 24-hour clock.

11. Administer 100 mL in 1 hr using a 15 gtt/mL set. Calculate the flow rate.

12. A client is to receive 1,800 mL of D5W in 24 hours with an infusion pump. At what flow rate will the pump deliver?

13. An IV of D5W and 1/2 NS 1,000 mL was ordered to infuse over 8 hours. Drop factor 15 gtt/mL. The IV was hung up at 7 am. At 11 am you check the IV, and noticed that 600 mL have infused.

a) Recalculate the rate in gtt/min for the remaining solution.

b) Determine the percentage of change in IV rate, and state your course of action.

14. a) Determine the infusion time for an IV of 500 mL NS is to infuse at 60 mL/hr and give the answer in hr and min;

b) The IV started at 11PM, at what time would the infusion be completed? State time in traditional (12-hour clock).

c) Express your answer to part (b) in military time (24-hour clock).

PART VI. DOSAGE CALCULATIONS BASED ON WEIGHT AND BSA

1. Esmolol 1.5 g in 250 mL D5W has been ordered at a rate of 100 mcg/kg/min for a client weighing 102.4 kg. Determine the following:

- a) dosage in mcg/min;
- b) rate in mL/hr.

2. Order: Morphine sulfate 7.5 mg subcut q4h p.r.n. for a child weighing 84 Lb.

Available: Morphine sulfate 15 mg/mL subcutaneous injection.

The recommended maximum dose for a child is 0.1 to 0.2 mg/kg/dose.

- a) What is the child's weight in kilograms to the nearest tenth?
- b) What is the safe dosage range for this child? Round your answer to the nearest hundredths.
- c) Is the dosage ordered safe? Justify your answer.
- d) How many milliliters will you administer for one dosage?

3. The child's BSA is $0.52 m^2$. The average child dosage for medication is $15 mg/m^2$. What will the child's dosage be?

4. The label reads: Antibiotic, Pediatric Patients Age 2 to 6 years: 0.25 mg /kg/day or 8 mg per square meter of the patient body surface area. Calculate the daily dosage for a 5-year-old child whose BSA is $0.78 m^2$.

5. A client with a weight of 187 Lb will receive a heparin infusion:

Heparin 28,000 units in 1,000 mL 0.9% sodium chloride.

Bolus with heparin sodium at 80 units/kg, then initiate drip at 18 units/kg/hr.

- (a) Calculate the initial heparin bolus dosage.
- (b) Calculate the infusion rate in units/hr, and determine the rate in mL/hr at which you will set the infusion device.

Answer Key

Part I. Arithmetic Review

- 1.68
- c) More than 1 tab
- 13
- 100 mg

Part II. Conversions

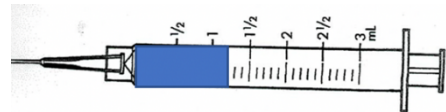
- a) 17.8 kg; b) 200 mg; c) 59.4 Lb; d) 0.016 mg; e) 45 mL; f) 2.5 Oz
- 5 cups
- 37 °C
- 218.2 Lb
- 100.8 °F
- 3:20 am
- 0300
- 660 mL

Part III. Reading Medication Labels

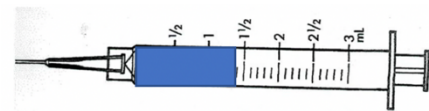
- Label (i): a) CIPRO; b) ciprofloxacin hydrochloride/miles; c) tablet; d) 250 mg/tab; e) 100 tablets. Label (ii): a) Cytotec; b) misoprostol; c) tablet; d) 100 mcg/tab; e) 60 tablets. Label (iii): a) no trade name stated; b) Hydromorphone; c) injectable liquid; d) 2 mg/mL; e) 20mL; f) Subcutaneous, Intramuscular or slow Intravenous use. Label (iv): a) No trade name stated; b) Diclofenac Sodium; c) 50 mg/tab; d) not safe. It is stated stored with controlled room temperature.
- Reconstituted with 127 mL water.
- a) 10 mL single-Dose Vial; b) 1 mg/10 mL; c) For IV use only.

Part IV. Dosage Calculations

- 1 tab
- 2 tabs
- a) the "30 mg tablets " is best to administer; b) 3 tabs; c) the tablet consists of 30 mg of Phenobarbital, the order is 90 mg, so $30 \text{ mg} \times 3 = 90 \text{ mg}$
- 10 mL
- 1 mL
- 2.4 mL
- a) 250,000 units/mL; b) 18.2 mL; c) 1.2 mL; d)



- a) 500,000 units/mL; b) 33 mL; c) 1.4 mL; d)



- Novolin R U-100: 41 units.

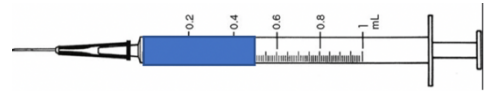


10. Regular insulin: 22 units.



11. 2 mL

12. 0.5 mL



13. 8 mL

14. 0.8 mL

15. 2 tab

16. 0.12 mg

17. Solute: 400 mL, solvent: 800 mL

Part V. Intravenous (IV) Calculations

1. a) D5 and $\frac{1}{2}$ NS; b) 25 g; c) 2.25 g
2. Dextrose: 50 g; Sodium Chloride 9 g
3. 20 gtt/min
4. a) 8 hr 20 min; b) (i) traditional time 6:20 am hours, (ii) military time 0620 hours
5. a) 10 gtt/min; b) -29%; c) This percent change is beyond +/- 25% range; notify a prescriber
6. a) 42 mL/hr; b) 1680 units/hr
7. a) added 46 mL; b) 33 mL/hr
8. 38 mL/hr
9. a) 72 mg/hr; b) 1200 mcg/min
10. a) 12 hr 30 min; b) 00:50 am
11. 25 gtt/min
12. 75 mL/hr
13. a) 25 gtt/min; b) -19%. This percent change is within +/- 25%; change the flow rate without notifying a prescriber.
14. a) 8 hr 20 min; b) 7:20 am; c) 0720

Part VI. Dosage Calculations Based on Weight and BSA

1. a) 10,240 mcg/min; b) 102.4 mL/hr
2. a) 38.2kg; b) 3.82- 7.64 mg/kg/dose; c) Yes; d) 0.5 mL
3. 7.8 mg
4. 6.24 mg
5. a) 6800 units; b) 1530 units/hr; 55 mL/hr