

Math Ability Exam Helpful Hints

1. PRINT OUT the calculation formulas provided by Prophecy and use these formulas to answer the questions
 - a. Have scratch paper, a pencil and a calculator ready – write out the formula using the appropriate numbers in the problem and then do your calculations
 - b. Don't round the answer you get when converting lbs to kg – us the full result that is on your calculator in your calculations
2. Know how to do metric conversions!!!
 - a. $1 \text{ mg} = 1000 \text{ mcg}$
 - b. $1 \text{ kg} = 1000 \text{ G}$
 - c. $1 \text{ G} = 1000 \text{ mg}$
 - d. $1 \text{ kg} = 2.2 \text{ lbs}$
3. Make sure to answer with the appropriate number of decimals as specified in the problem, rounding correctly.
4. Make sure the answer makes sense!! If unsure, plug your answer back into the calculation to make sure it's the correct answer.
5. Use critical thinking to reason through how to determine the answer if you are struggling with a question
6. Keep in mind that sometimes there is more information in the problem than you need to answer the question
7. If you are struggling with figuring out an answer, try a different way mathematically do approach the problem
8. Want to practice before taking the test? Check out these sites (there are lots of practice to be found on the internet)
 - a. <https://www.youtube.com/watch?v=hnzZKY8SGbE>
 - b. <https://www.registerednursern.com/dosage-calculations-nursing-comprehensive-quiz/>
 - c. <https://www.leveluprn.com/blogs/dosage-calculation>



BASIC CALCULATION FORMULAS

****NOTE** – *The following formulas are some methods used to accurately and safely perform math calculations in the healthcare setting. There are other formulas and methods available and acceptable for accurately calculating dosages.*

Drug Dosage Calculations for Oral & Parenteral Doses

Formula Method

$$\frac{D}{H} \times Q = A$$

D = Desired *Dose* (or dose ordered)

H = Have *Available* (dosage of the available medication on hand)

Q = *Quantity* (unit of measure of the available medication on hand)
Such as one tablet, 2 capsules or volume (mL)

A = *Amount* of Medication to Administer

Any unlawful use or reproduction of this data and content will be prosecuted to the fullest extent of the law.

Calculating IV Flow Rates

Calculating Flow Rate mL/hr

$$\frac{\text{Total volume ordered (mL)}}{\text{Total hours ordered (hr)}} = \text{Flow Rate (mL/hr)}$$

Calculating Flow Rate in Drop Factor gtt/min

$$\frac{\text{Volume (mL)} \times \text{Drop factor (gtt/mL)}}{\text{Time (hr)} \times 60 \text{ minutes}} = \text{Drip Rate (gtt/min)}$$

Calculating Infusion Rate mL/hr

$$\frac{D \text{ (Unit/hr ordered)}}{H \text{ (Units on hand)}} \times V \text{ (mL on hand)} = \text{Infusion Rate (mL/hr)}$$

Drug Concentration

$$\frac{\text{Amount of drug in solution (g, mg, mcg, etc.)}}{\text{Amount of solution (mL)}} = \text{Drug Concentration}$$

Amount pt is receiving per hour

$$\text{Drug Concentration} \times \text{Infusion Rate} = \text{mg/hr}$$

Any unlawful use or reproduction of this data and content will be prosecuted to the fullest extent of the law.

Dosage Calculations by Body Weight

Body Weight Conversion

of lbs = weight in kilograms

2.2

Desired Dose:

Dosage Ordered per kg x Weight (kg) = Desired Dose

(May be ordered as mg/kg, mcg/kg, mEq/kg, mg/kg/day, etc.)

Dose to be given by Weight:

$\frac{D}{H} \times Q = A$ $\frac{\text{Desired Dose (mg)}}{\text{Have Available (mg)}} \times Q \text{ (mL)} = \text{Dose (mL)}$

OR Simplified:

$\frac{\text{Dosage Ordered (mg/kg)} \times \text{Weight (kg)} \times Q \text{ (mL)}}{\text{Have (mg)}} = \text{Dose (mL)}$

ADVANCED CALCULATION FORMULAS

mg/min

Dose in mg/min the patient is receiving based on infusion rate on pump:

Concentration Available (mg) \div Volume Available (mL) \div 60 min/hr X Infusion Rate on IV Pump (mL/hr) = **mg/min**

Example:

 mg \div mL \div 60 min/hr x mL/hr = **mg/min**

Any unlawful use or reproduction of this data and content will be prosecuted to the fullest extent of the law.

mcg/kg/min

Dose in mcg/kg/min the patient is receiving based on infusion rate on pump:

Concentration Available (mg) X 1000 (to convert to mcg) ÷ Volume Available (mL) ÷ 60 min/hr ÷ Weight (kg) X Infusion Rate on IV Pump (mL/hr) = **mcg/kg/min**

Example:

 mg X 1000 mcg ÷ mL ÷ 60 min/hr ÷ kg X mL/hr = **mcg/kg/min**

Rate to infuse on IV pump based on ordered dosage (mcg/kg/min):

 mcg/kg/min X mL in bag X 60 min/hr X wt in kg
 _____ = mL/hr to infuse
 mg in bag X 1000

mcg/min

Dose in mcg/min the patient is receiving based on infusion rate on pump:

Concentration Available (mg) X 1000 (to convert to mcg) ÷ Volume Available (mL) ÷ 60 min/hr X Infusion Rate on IV Pump (mL/hr) = **mcg/min**

Example:

 mg X 1000 mcg ÷ ml ÷ 60 min/hr X mL/hr = **mcg/min**

Rate to infuse on IV pump based on ordered dosage (mcg/min):

 mcg/min X mL in bag X 60 min/hr
 _____ = mL/hr to infuse
 mg in bag X 1000

Any unlawful use or reproduction of this data and content will be prosecuted to the fullest extent of the law.