Name: ANSWERS

Date:

Baldivis Secondary College

Year 12 Mathematics: Essentials

Investigation 1, 2018

Topic - Measurement

IN CLASS ONLY

Total Time:	45 mins
Weighting:	7 %
Equipment:	*Take home component, Scientific calculator*

/ 26

%

DOSAGES

Children are more sensitive than adults to medications because of their weight, height, physical condition, immature systems, and metabolism.

Part 1: **[6 marks]**

Infant's and young children's weight in pounds must be converted to kilograms to accurately calculate medication doses and daily fluid requirements.

The formula: 2.2 lb = 1 kg

Question 1. A child weighs 47 lb. Convert the child's weight to kilograms (round to 2 decimal places)

47 × 2.2 ✓

= 103.40 kg ✓

47 ÷ 2.2 ✓

= 21.36 kg ✓

Question 2. A child weighs 92 lb. Convert the child's weight to kilograms (round to 2 decimal places) ✓

92 × 2.2 ✓

= 202.40 kg ✓

92 ÷ 2.2 ✓

= 41.82 kg

Question 3. A child weighs 9.5kg. Convert the child's weight to pounds (round to 2 decimal places) ✓

9.5 ÷ 2.2 ✓

= 4.32 Lb. ✓

9.5 × 2.2 ✓

= 20.90 Lb.

[12 marks]

Part 2:

Paediatric patients, which include both infants and children, require special dosing that is adjusted for their body weight. A number of formulas have been used throughout the years to determine the best dose for paediatric patients.

FORMULA	Pediatric Dosing
Fried's Rule	$\text{Child's dosage} = \frac{\text{Age in months}}{150} \times \text{Adult dosage}$
Young's Rule	$\text{Child's dosage} = \frac{\text{Age of child in years}}{\text{Age of child in years} + 12} \times \text{Adult dosage}$
Clark's Rule	$\text{Child's dosage} = \frac{\text{Child's weight in pounds}}{150} \times \text{Adult dosage}$

Using **Fried's** rule:

Question 1. A child, 2 years old, needs acetaminophen, and the normal adult dose is 650 mg. What is the appropriate dosage for the child?

$\frac{24}{150} \times 650 = 104\text{ mg}$ ✓ ✓

Question 2. An 18-month-old needs amikacin sulfate, and the normal adult dose is 250 mg. What is the appropriate dosage for the child?

$\frac{18}{150} \times 250 = 30\text{ mg}$ ✓ ✓

Using **Young's** rule:

Question 3. A 24-month-old child is prescribed amoxicillin, and the normal adult dose is 500 mg. What is the appropriate dosage for the child?

$\frac{2}{14} \times 500 = 71.43\text{ mg}$ ✓ ✓

Question 4. A 42-month-old needs propylthiouracil, and the normal adult daily dose is 150 mg. What is the appropriate dosage for the child?

$$\frac{3.5}{15.5} \times 150 = 33.87\text{mg}$$

✓ ✓

Using **Clark's** rule:

Question 5. A child, weighing 85 pounds, is prescribed hydrochlorothiazide, and the normal adult dose is 50 mg. What is the appropriate dosage for the child?

$$\frac{85}{150} \times 50\text{mg} = 28.33\text{mg}$$

✓ ✓

Question 6. A child, weighing 70 pounds, is prescribed quinine sulfate, and the normal adult dose is 325 mg TID. What is the appropriate dosage for the child?

$$\frac{70}{150} \times 325 = 151.67\text{mg}$$

✓ ✓

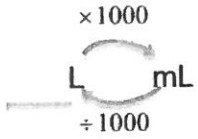
Part 3: **[8 marks]**

Calculation of Intravenous (IV) Infusions

The formula:

$$rate(ml/h) = \frac{volume\ (mL)}{time\ (h)}$$

Conversion Tip



Question 1. Mr Smith is to receive 800mL of an antibiotic via an IV infusion over 15 hours. Calculate the flow rate to be set.

$\frac{800}{15} = 53.33\ mL/h.$ ✓ ✓

Question 2. 0.5L is to infuse over a 5hour period. Find the flow rate in mL/h.

$0.5 \times 1000 = 500$ ✓

$\frac{500}{5} = 100\ mL/h.$ ✓ ✓

Question 3. 500 mL of antibiotic is to be infused over the 120 minutes by an infusion pump. Calculate the flow rate (mL per hour).

$120 \div 60 = 2$ ✓

$\frac{500}{2} = 250\ mL/h$ ✓ ✓