ANSWERS

CHAPTER 15 Dimensional Analysis—Work Sheet, pp. 453–459

1. $\frac{x \text{ mL}}{\text{h}} = \frac{500 \text{ mL}}{24 \text{ h}} = 20.8 \text{ or } 21 \text{ mL/h}$

2. $\frac{x \text{ mL}}{\text{h}} = \frac{100 \text{ mL}}{1 \text{ h}} = 100 \text{ mL/h}$

3. $\frac{x \text{ gtt}}{\text{min}} = \frac{15 \text{ gtt}}{1 \text{ mL}} \times \frac{100 \text{ mL}}{30 \text{ min}} = 50 \text{ gtt/min}$

4. $\frac{x \text{ mL}}{\text{h}} = \frac{3000 \text{ mL}}{12 \text{ h}} = 250 \text{ mL/h}$

5. $\frac{x \text{ gtt}}{\text{min}} = \frac{10 \text{ gtt}}{1 \text{ mL}} \times \frac{100 \text{ mL}}{30 \text{ min}}$
$= 33.3$ rounded to 33 gtt/min

6. $\frac{x \text{ mL}}{\text{h}} = \frac{500 \text{ mL}}{6 \text{ h}} = 83.3 \text{ or } 83 \text{ mL/h}$

7. $\frac{x \text{ gtt}}{\text{min}} = \frac{10 \text{ gtt}}{1 \text{ mL}} \times \frac{100 \text{ mL}}{60 \text{ min}}$
$= 16.6$ rounded to 17 gtt/min

8. $\frac{x \text{ mL}}{\text{h}} = \frac{250 \text{ mL}}{60 \text{ mEq}} \times \frac{20 \text{ mEq}}{1 \text{ h}}$
$= 83.3 \text{ or } 83 \text{ mL/h}$

9. $\frac{x \text{ gtt}}{\text{min}} = \frac{60 \text{ gtt}}{1 \text{ mL}} \times \frac{50 \text{ mL}}{30 \text{ min}} = 100 \text{ gtt/min}$

10. $\frac{x \text{ mL}}{\text{h}} = \frac{100 \text{ mL}}{15 \text{ min}} \times \frac{60 \text{ min}}{1 \text{ h}} = 400 \text{ mL/h}$

11. $\frac{x \text{ gtt}}{\text{min}} = \frac{60 \text{ gtt}}{1 \text{ mL}} \times \frac{50 \text{ mL}}{15 \text{ min}} = 200 \text{ gtt/min}$

12. $\frac{x \text{ mL}}{\text{h}} = \frac{200 \text{ mL}}{400 \text{ mg}} \times \frac{200 \text{ mg}}{1 \text{ h}} = 100 \text{ mL/h}$

13. $\frac{x \text{ gtt}}{\text{min}} = \frac{10 \text{ gtt}}{1 \text{ mL}} \times \frac{1000 \text{ mL}}{1 \text{ h}} \times \frac{1 \text{ h}}{60 \text{ min}}$
$= 166.6$ rounded to 167 gtt/min

14. $\frac{x \text{ mL}}{\text{h}} = \frac{500 \text{ mL}}{4 \text{ h}} = 125 \text{ mL/h}$

15. $\frac{x \text{ gtt}}{\text{min}} = \frac{15 \text{ gtt}}{1 \text{ mL}} \times \frac{25 \text{ mL}}{15 \text{ min}} = 25 \text{ gtt/min}$

16. $\frac{x \text{ mL}}{\text{h}} = \frac{100 \text{ mL}}{20 \text{ mg}} \times \frac{0.5 \text{ mg}}{1 \text{ h}}$
$= 2.5 \text{ or } 3 \text{ mL/h}$

17. $\frac{x \text{ gtt}}{\text{min}} = \frac{20 \text{ gtt}}{1 \text{ mL}} \times \frac{25 \text{ mL}}{15 \text{ min}}$
$= 33.3$ rounded to 33 gtt/min

18. $\frac{x \text{ mL}}{\text{h}} = \frac{100 \text{ mL}}{2 \text{ g}} \times \frac{1 \text{ g}}{1 \text{ h}} = 50 \text{ mL/h}$

19. $\frac{x \text{ gtt}}{\text{min}} = \frac{20 \text{ gtt}}{1 \text{ mL}} \times \frac{250 \text{ mL}}{4 \text{ h}} \times \frac{1 \text{ h}}{60 \text{ min}}$
$= 20.8$ rounded to 21 gtt/min

20. $\frac{x \text{ mL}}{\text{h}} = \frac{100 \text{ mL}}{15 \text{ min}} \times \frac{60 \text{ min}}{1 \text{ h}} = 400 \text{ mL/h}$

21. $\frac{x \text{ mL}}{\text{h}} = \frac{200 \text{ mL}}{40 \text{ mEq}} \times \frac{10 \text{ mEq}}{1 \text{ h}} = 50 \text{ mL/h}$

22. $\frac{x \text{ mL}}{\text{h}} = \frac{1350 \text{ mL}}{10 \text{ h}} = 135 \text{ mL/h}$

23. $\frac{x \text{ mL}}{\text{h}} = \frac{50 \text{ mL}}{2 \text{ g}} \times \frac{1 \text{ g}}{1 \text{ h}} = 25 \text{ mL/h}$

24. $\frac{x \text{ mL}}{\text{h}} = \frac{200 \text{ mL}}{1 \text{ h}} = 200 \text{ mL/h}$

25. $\frac{x \text{ gtt}}{\text{min}} = \frac{20 \text{ gtt}}{1 \text{ mL}} \times \frac{100 \text{ mL}}{30 \text{ min}}$
$= 66.6$ rounded to 67 gtt/min

26. $\frac{x \text{ mL}}{\text{h}} = \frac{50 \text{ mL}}{30 \text{ min}} \times \frac{60 \text{ min}}{1 \text{ h}} = 100 \text{ mL/h}$

27. $\frac{x \text{ gtt}}{\text{min}} = \frac{20 \text{ gtt}}{1 \text{ mL}} \times \frac{200 \text{ mL}}{1 \text{ h}} \times \frac{1 \text{ h}}{60 \text{ min}}$
$= 66.6$ rounded to 67 gtt/min

28. $\frac{x \text{ mL}}{\text{h}} = \frac{500 \text{ mL}}{8 \text{ h}} = 62.5 \text{ or } 63 \text{ mL/h}$

29. $\frac{x \text{ mL}}{\text{h}} = \frac{250 \text{ mL}}{200 \text{ mg}} \times \frac{5 \text{ mg}}{1 \text{ h}} = 6.3 \text{ or } 6 \text{ mL/h}$

30. $\frac{x \text{ gtt}}{\text{min}} = \frac{60 \text{ gtt}}{1 \text{ mL}} \times \frac{50 \text{ mL}}{30 \text{ min}} = 100 \text{ gtt/min}$

31. $\frac{x \text{ mL}}{\text{h}} = \frac{250 \text{ mL}}{2 \text{ h}} = 125 \text{ mL/h}$

32. $\frac{x \text{ mL}}{\text{h}} = \frac{1000 \text{ mL}}{10 \text{ h}} = 100 \text{ mL/h}$

33. $\frac{x \text{ mL}}{\text{h}} = \frac{9600 \text{ mL}}{8 \text{ h}} = 1200 \text{ mL/h}$

34. $\frac{x \text{ mL}}{\text{h}} = \frac{100 \text{ mL}}{3 \text{ h}} = 33.3 \text{ or } 33 \text{ mL/h}$

35. $\frac{x \text{ mL}}{\text{h}} = \frac{100 \text{ mL}}{100 \text{ mg}} \times \frac{20 \text{ mg}}{1 \text{ h}} = 20 \text{ mL/h}$

36-38. The information needed to calculate the rate of administration include over 2 hours, how many milliliters per hour, and 300 mL.

Options	
Vancomycin-resistant enterococci	How many milliliters per hour
linezolid 600 mg	600 mg/300 mL
over 2 hours	300 mL
every 12 hours	

Rationale:

While all information related to medication information is important for the nurse to be aware of, only the duration of the infusion (2 hours), what is being solved for (mL/h), and the volume to be infused (300 mL) are needed to calculate the rate of administration in milliliters per hour. The patient's medical problem (vancomycin-resistant enterococcus), the name of the drug (linezolid), the schedule of the drug (every 12 hours), the dose of the drug (600 mg) are not needed for the calculation the nurse is performing.

$$\frac{x \text{ mL}}{\text{h}} = \frac{300 \text{ mL}}{2 \text{ h}} = 150 \text{ mL/h}$$

CHAPTER 15 Dimensional Analysis—Posttest 1, pp. 461–464

1. $\frac{x \text{ mL}}{\text{h}} = \frac{500 \text{ mL}}{2 \text{ h}} = 250 \text{ mL/h}$

2. $\frac{x \text{ mL}}{\text{h}} = \frac{500 \text{ mL}}{4 \text{ h}} = 125 \text{ mL/h}$

3. $\frac{x \text{ gtt}}{\text{min}} = \frac{12 \text{ gtt}}{1 \text{ mL}} \times \frac{120 \text{ mL}}{1 \text{ h}} \times \frac{1 \text{ h}}{60 \text{ min}}$
$= 24 \text{ gtt/min}$

4. $\frac{x \text{ gtt}}{\text{min}} = \frac{15 \text{ gtt}}{1 \text{ mL}} \times \frac{500 \text{ mL}}{4 \text{ h}} \times \frac{1 \text{ h}}{60 \text{ min}}$
$= 31.2 \text{ rounded to } 31 \text{ gtt/min}$

5. $\frac{x \text{ mL}}{\text{h}} = \frac{1500 \text{ mL}}{8 \text{ h}} = 187.5 \text{ or } 188 \text{ mL/h}$

6. $\frac{x \text{ gtt}}{\text{min}} = \frac{12 \text{ gtt}}{1 \text{ mL}} \times \frac{250 \text{ mL}}{3 \text{ h}} \times \frac{1 \text{ h}}{60 \text{ min}}$
$= 16.6 \text{ rounded to } 17 \text{ gtt/min}$

7. $\frac{x \text{ gtt}}{\text{min}} = \frac{15 \text{ gtt}}{1 \text{ mL}} \times \frac{1000 \text{ mL}}{12 \text{ h}} \times \frac{1 \text{ h}}{60 \text{ min}}$
$= 20.8 \text{ rounded to } 21 \text{ gtt/min}$

8. $\frac{x \text{ mL}}{\text{h}} = \frac{50 \text{ mL}}{2 \text{ g}} \times \frac{1 \text{ g}}{1 \text{ h}} = 25 \text{ mL/h}$

9. $\frac{x \text{ gtt}}{\text{min}} = \frac{60 \text{ gtt}}{1 \text{ mL}} \times \frac{150 \text{ mL}}{1 \text{ h}} \times \frac{1 \text{ h}}{60 \text{ min}}$
$= 150 \text{ gtt/min}$

10. $\frac{x \text{ mL}}{\text{h}} = \frac{2500 \text{ mL}}{24 \text{ h}} = 104.1 \text{ or } 104 \text{ mL/h}$

11. $\frac{x \text{ mL}}{\text{h}} = \frac{200 \text{ mL}}{30 \text{ mOsm}} \times \frac{10 \text{ mOsm}}{1 \text{ h}}$
$= 66.7 \text{ or } 67 \text{ mL/h}$

12. $\frac{x \text{ gtt}}{\text{min}} = \frac{60 \text{ gtt}}{1 \text{ mL}} \times \frac{25 \text{ mL}}{15 \text{ min}} = 100 \text{ gtt/min}$

13. $\frac{x \text{ mL}}{\text{h}} = \frac{200 \text{ mL}}{100 \text{ mg}} \times \frac{15 \text{ mg}}{1 \text{ h}} = 30 \text{ mL/h}$

14. $\frac{x \text{ mL}}{\text{h}} = \frac{100 \text{ mL}}{30 \text{ min}} \times \frac{60 \text{ min}}{1 \text{ h}} = 200 \text{ mL/h}$

15. $\frac{x \text{ gtt}}{\text{min}} = \frac{60 \text{ gtt}}{1 \text{ mL}} \times \frac{100 \text{ mL}}{1 \text{ h}} \times \frac{1 \text{ h}}{60 \text{ min}}$
$= 100 \text{ gtt/min}$

CHAPTER 15 Dimensional Analysis—Posttest 2, pp. 465–468

1. $\frac{x \text{ mL}}{\text{h}} = \frac{200 \text{ mL}}{6 \text{ h}} = 33.3 \text{ or } 33 \text{ mL/h}$

2. $\frac{x \text{ gtt}}{\text{min}} = \frac{10 \text{ gtt}}{1 \text{ mL}} \times \frac{250 \text{ mL}}{60 \text{ min}}$
$= 41.6 \text{ rounded to } 42 \text{ gtt/min}$

3. $\frac{x \text{ mL}}{\text{h}} = \frac{200 \text{ mL}}{6 \text{ h}} = 133.3 \text{ or } 133 \text{ mL/h}$

4. $\frac{x \text{ gtt}}{\text{min}} = \frac{15 \text{ gtt}}{1 \text{ mL}} \times \frac{500 \text{ mL}}{3 \text{ h}} \times \frac{1 \text{ h}}{60 \text{ min}}$
$= 41.6 \text{ rounded to } 42 \text{ gtt/min}$

5. $\frac{x \text{ gtt}}{\text{min}} = \frac{10 \text{ gtt}}{1 \text{ mL}} \times \frac{1000 \text{ mL}}{6 \text{ h}} \times \frac{1 \text{ h}}{60 \text{ min}}$
$= 27.7$ rounded to 28 gtt/min

6. $\frac{x \text{ mL}}{\text{h}} = \frac{50 \text{ mL}}{30 \text{ min}} \times \frac{60 \text{ min}}{1 \text{ h}} = 100 \text{ mL/h}$

7. $\frac{x \text{ mL}}{\text{h}} = \frac{100 \text{ mL}}{100 \text{ mg}} \times \frac{8 \text{ mg}}{1 \text{ h}} = 8 \text{ mL/h}$

8. $\frac{x \text{ gtt}}{\text{min}} = \frac{60 \text{ gtt}}{1 \text{ mL}} \times \frac{50 \text{ mL}}{15 \text{ min}} = 200 \text{ gtt/min}$

9. $\frac{x \text{ gtt}}{\text{min}} = \frac{15 \text{ gtt}}{1 \text{ mL}} \times \frac{50 \text{ mL}}{15 \text{ min}} = 50 \text{ gtt/min}$

10. $\frac{x \text{ mL}}{\text{h}} = \frac{1000 \text{ mL}}{6 \text{ h}} = 166.7 \text{ or } 167 \text{ mL/h}$

11. $\frac{x \text{ mL}}{\text{h}} = \frac{100 \text{ mL}}{8 \text{ mg}} \times \frac{0.4 \text{ mg}}{1 \text{ h}} = 5 \text{ mL/h}$

12. $\frac{x \text{ mL}}{\text{h}} = \frac{1200 \text{ mL}}{8 \text{ h}} = 150 \text{ mL/h}$

13. $\frac{x \text{ mL}}{\text{h}} = \frac{200 \text{ mL}}{90 \text{ min}} \times \frac{60 \text{ min}}{1 \text{ h}} = 100 \text{ mL/h}$

14. $\frac{x \text{ gtt}}{\text{min}} = \frac{10 \text{ gtt}}{1 \text{ mL}} \times \frac{1000 \text{ mL}}{3 \text{ h}} \times \frac{1 \text{ h}}{60 \text{ min}}$
$= 55.5$ rounded to 56 gtt/min

15. $\frac{x \text{ mL}}{\text{h}} = \frac{500 \text{ mL}}{6 \text{ h}} = 83.3 \text{ or } 83 \text{ mL/h}$

CHAPTER 15 Proportion/Formula Method—Work Sheet, pp. 453–459

Proportion	Formula
1.	$\frac{500 \text{ mL}}{24 \text{ h}} = 20.8 \text{ or } 21 \text{ mL/h}$
2.	$\frac{100 \text{ mL}}{1 \text{ h}} = 100 \text{ mL/h}$
3.	$\frac{100 \text{ mL}}{\overset{2}{\cancel{30}} \text{ min}} \times \overset{1}{\cancel{15}} \text{ gtt/mL} = 50 \text{ gtt/min}$
4.	$\frac{3000 \text{ mL}}{12 \text{ h}} = 250 \text{ mL/h}$
5.	$\frac{100 \text{ mL}}{\overset{3}{\cancel{30}} \text{ min}} \times \overset{1}{\cancel{10}} \text{ gtt/mL} = 33 \text{ gtt/min}$
6.	$\frac{500 \text{ mL}}{6 \text{ h}} = 83.3 \text{ or } 83 \text{ mL/h}$
7.	$\frac{100 \text{ mL}}{\overset{6}{\cancel{60}} \text{ min}} \times \overset{1}{\cancel{10}} \text{ gtt/mL} = 17 \text{ gtt/min}$
8. 60 mEq : 250 mL :: 20 mEq : x mL $x = 83.3$ or 83 mL/h	$\frac{\overset{1}{\cancel{20}} \text{ mEq}}{\overset{3}{\cancel{60}} \text{ mEq}} \times 250 \text{ mL} = 83.3 \text{ or } 83 \text{ mL/h}$
9.	$\frac{50 \text{ mL}}{\overset{1}{\cancel{30}} \text{ min}} \times \overset{2}{\cancel{60}} \text{ gtt/mL} = \frac{100}{1} = 100 \text{ gtt/min}$