

10 Part I: Multiple Choice. Place the correct answer in the corresponding blank at the end of this section.

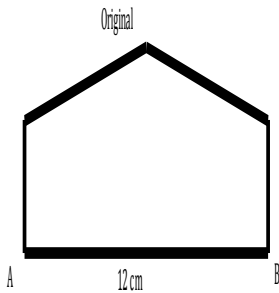
1. Which has a unit rate of \$0.16/apple?

- (A) 20 apples for \$3.00
- (B) 25 apples for \$4.25
- (C) 30 apples for \$4.95
- (D) 35 apples for \$5.60

$$\frac{\$5.60}{35} = 0.16$$

~~1.4~~

2. The pentagon shown is transformed by a scale factor of $\frac{1}{4}$. What is the length of the image of side AB?



- (A) 3 cm
- (B) 9 cm
- (C) 15 cm
- (D) 48 cm

$$k = \frac{\text{scale}}{\text{original}}$$

$$\frac{1}{4} = \frac{x}{12}$$

$$4x = 12$$

$$\frac{4x}{4} = \frac{12}{4}$$

$$x = 3$$

3. A partially inflated heart-shaped balloon is 15 cm wide and has a volume of 1600 cm³. If air is added until the balloon is 30 cm wide, what is the new volume?

- (A) 3200 cm³
- (B) 6400 cm³
- (C) 9600 cm³
- (D) 12800 cm³

$$2 \times 15 = 30$$

Scale factor: 2

$$k^3 = \frac{\text{scale volume}}{\text{original volume}}$$

$$2^3 = \frac{x}{1600}$$

$$\frac{8}{1} = \frac{x}{1600}$$

$$x = 12800$$

4. 240 000 L of water is consumed among 60 households in the neighborhood. What is the rate per household in litres?

- (A) 0.000 25
(B) 4000
(C) 40000
(D) 14400000

$$\frac{240\,000}{60} = 4000 \text{ L/household}$$

5. A map measuring 20 cm by 25 cm has its dimensions enlarged using a scale of 1 cm : 2 cm. By what factor does the area increase?

- (A) $\frac{1}{4}$
(B) $\frac{1}{2}$
(C) 2
(D) 4

Scale factor: 2

$$(k)^2 = 2^2 = 4$$

6. Six bottles of cola costs \$2.99. A convenience store manager plans to purchase 140 bottles in order to fill the store cooler. If she can only purchase the bottles by packages of six, how much does she spend?

- (A) \$46.82
(B) \$68.77
(C) \$69.77
(D) \$71.76

$$\frac{140}{6} = 23.3 \sim 24$$

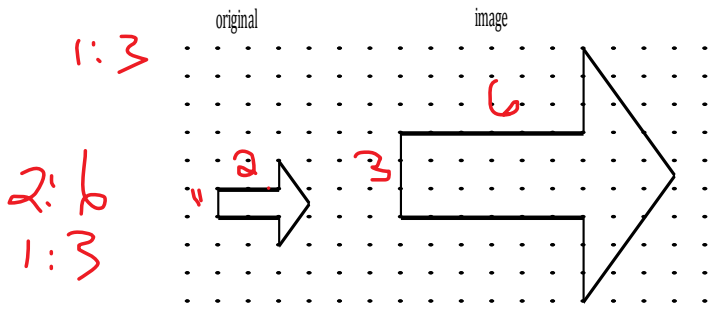
$$24 \times \$2.99 = \$71.76$$

7. Andrew sent 4650 text messages in 31 days. Sean sent 1155 in 7 days. Who will have the highest text rate per day and by how many?

- (A) Andrew (extra 15 texts per day)
(B) Andrew (extra 30 texts per day)
(C) Sean (extra 15 texts per day)
(D) Sean (extra 30 texts per day)

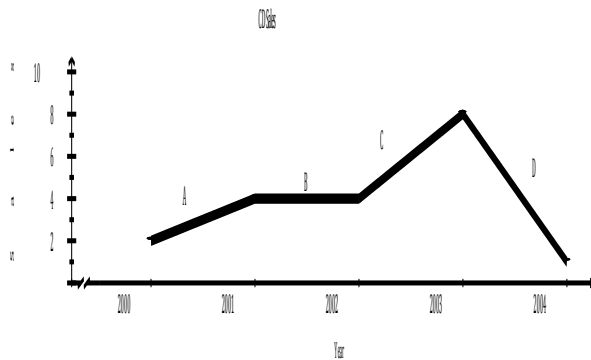
$$\begin{array}{r} 4650 \\ \hline 31 \\ \hline \end{array} = 150/\text{day} \quad \begin{array}{r} 1155 \\ \hline 7 \\ \hline \end{array} = 165/\text{day}$$
$$165 - 150 = 15$$

8. What is the scale factor in the figure below?



- (A) $\frac{1}{3}$
- (B) $\frac{1}{2}$
- (C) 2
- (D) 3**

9. During which time period was the growth rate of CD sales the greatest in the graph shown?



- (A) 2000 – 2001
- (B) 2001 – 2002
- (C) 2002 – 2003**
- (D) 2003 – 2004

10. The surface area of a cone is 34 ft^2 . If the cone is enlarged by a scale factor of 3, what is the surface area, in ft^2 , of the image?

(A) 37
 (B) 102
 (C) 306
 (D) 918

$k^2 = \frac{\text{Scale}}{\text{original}} \rightarrow k = 306$
 $3^2 = \frac{x}{34}$
 $9 = \frac{x}{34}$

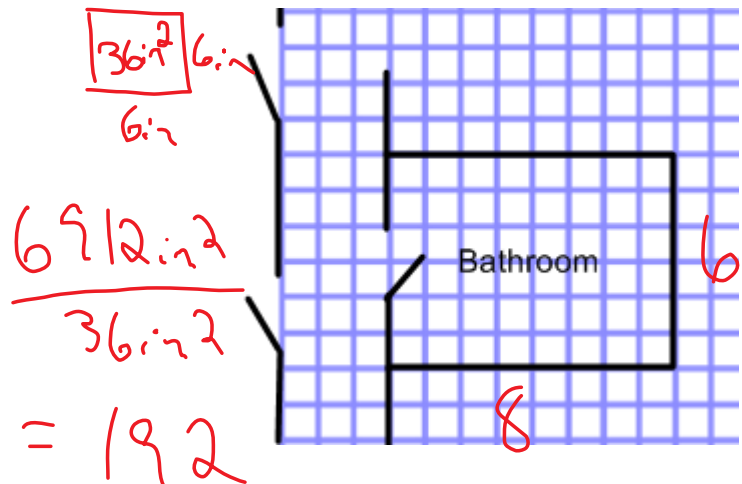
Answers to multiple choice.

1. ___ 2. ___ 3. ___ 4. ___ 5. ___
 6. ___ 7. ___ 8. ___ 9. ___ 10. ___

20 **Part II: Constructed Response. Answer each question in the space provided. Show all workings.**

5 11. The floor plan has a scale of 1 unit = 12 inches. The owner intends to use 6 inch by 6 inch square tiles to cover the floor of the bathroom. Tiles cost \$0.99 each. What is the total cost of the tiles?

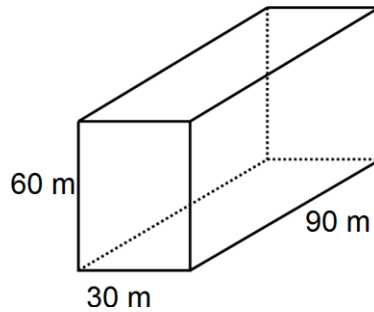
$l = 8 \times 12 \text{ in} = 96 \text{ in}$
 $w = 6 \times 12 \text{ in} = 72 \text{ in}$
 $A = l \cdot w$
 $= 96 \text{ in} \times 72 \text{ in}$
 $= 6912 \text{ in}^2$



$192 \times \$0.99 = \190.08

5

12. An underground storage tank is used to collect storm water.



A new tank is needed with a volume of 8 times the present tank. Determine the dimensions of the new tank if every side is enlarged by the same factor.

$$\sqrt[3]{k^3} = \sqrt[3]{8}$$

$$k = 2$$

$$60\text{ m} \times 2 = 120\text{ m}$$

$$30\text{ m} \times 2 = 60\text{ m}$$

$$90\text{ m} \times 2 = 180\text{ m}$$

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13. Nicole designed a rectangular crest that was 8 cm by 10 cm for her school's jacket. The crest was then enlarged to create a poster that had an area of 980 cm². What are the dimensions of the poster?

$$\text{original area: } 8\text{ cm} \times 10\text{ cm} = 80\text{ cm}^2$$

$$k^2 = \frac{\text{Scale}}{\text{original}}$$

$$k^2 = \frac{980}{80}$$

$$k^2 = 12.25$$

$$\sqrt{k^2} = \sqrt{12.25}$$

$$k = 3.5$$

$$8\text{ cm} \times 3.5 = 28\text{ cm}$$

$$10\text{ cm} \times 3.5 = 35\text{ cm}$$

- 5 14. Find the volume of a sphere if its image has a volume of 450 cm^3 and a scale factor of 1:4.

$$k^3 = \frac{\text{scale}}{\text{original}}$$
$$\left(\frac{1}{4}\right)^3 = \frac{450}{x}$$
$$\frac{1}{64} = \frac{450}{x}$$

$\rightarrow x = 28800 \text{ cm}^3$