# Grade 9 Applied Math

## Unit 2
## Practice Test Questions

# SOLUTIONS

1) Which of the following ratios is equivalent to 2:5?

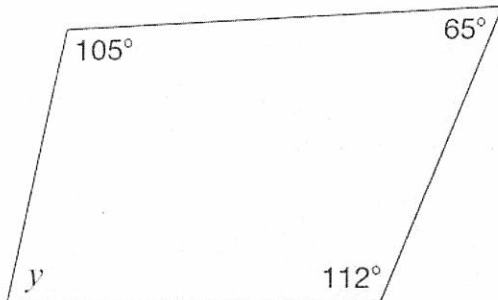a   5:2

b   2:7

c   14:35

d   22:25

$\times 7 \left( \dfrac{2:5}{14:35} \right) \times 7$

2) What is the value of $k$ in the proportion below?

$$\dfrac{9}{k} = \dfrac{24}{32}$$

a   12

b   15

c   16

d   17

$24k = 9 \times 32$

$24k = 288$

$k = \dfrac{288}{24}$

$k = 12$

3) What is the value of $y$ in the diagram below?

105°     65°

$y$       112°

a   65°

b   75°

c   78°

d   102°

$360° - 105° - 65° - 112°$

$= 78°$

4) Jensen is seeding his lawn. The shape of his lawn is shown in the diagram below.

30 m     ①       ②

—54 m—
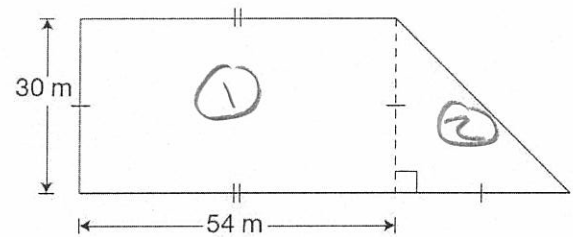
Each bag of grass seed covers 310 m².

What is the minimum number of bags of seed that Jensen will need to seed his entire lawn?

a   5

b   6

c   7

d   8

① $A = lw$
$= 54 \times 30$
$= 1620$

② $A = \dfrac{bh}{2}$
$= \dfrac{30 \times 30}{2}$
$= 450$

Total area $= 1620 + 450$
$= 2070$

# of bags $= 2070 \div 310$
$= 6.7$
∴ need 7 bags

5) Consider the triangle shown on the right.

a) Determine the perimeter of the triangle.

$$P = 5.2 + 3.4 + 6.1$$
$$= \boxed{14.7 \text{ cm}}$$



5.2 cm   3.4 cm

36°    x

6.1 cm
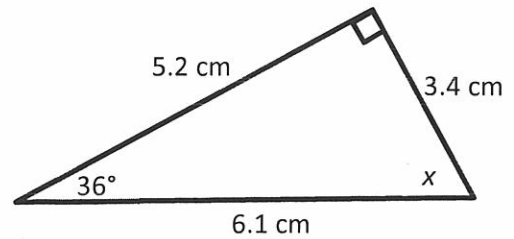
b) Determine the area of the triangle.

$$A = \frac{bh}{2}$$
$$= \frac{(5.2)(3.4)}{2} \rightarrow = \boxed{8.84 \text{ cm}^2}$$

c) Find the value of angle $x$ in the triangle.

$$180° - 90° - 36°$$
$$= 54°$$        $$\boxed{\therefore x = 54°}$$

6) Express the following ratios in their simplest form.

a) 4:2        b) $\frac{3}{18}$        c) 100 to 40

$$= 2:1 \quad \Big\} \div 2$$

$$= \frac{1}{6} \quad \Big\} \div 6$$

$$= 5:2 \quad \Big\} \div 20$$

7) Solve for the unknown quantities.

a) $\frac{3}{7} = \frac{x}{35}$        b) $\frac{x}{20} = \frac{2}{5}$

$$7x = 3 \times 35$$
$$7x = 105$$
$$x = \frac{105}{7}$$
$$\boxed{x = 15}$$
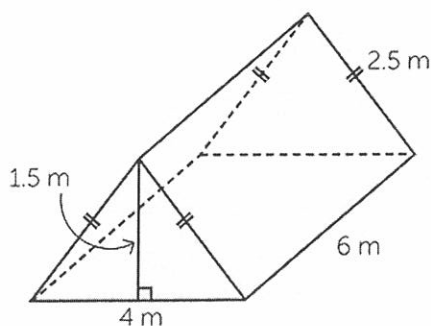
$$5x = 2 \times 20$$
$$5x = 40$$
$$x = \frac{40}{5}$$
$$\boxed{x = 8}$$

8) Determine the volume of the following triangular prism.



2.5 m

1.5 m

6 m

4 m

$$V = \frac{bhl}{2}$$
$$= \frac{(4)(1.5)(6)}{2}$$
$$= \boxed{18 \text{ m}^3}$$

9) Two stores are advertising specials on apples.

| Store A | Store B |
|---|---|
| 8 apples for $4.40 | 12 apples for $5.76 |

Apples are sold individually.

How much less would 30 apples cost at Store B than at Store A?

Justify your answer.

Store A

$4.40 \div 8 = \$0.55$ per apple

30 apples $= \$0.55 \times 30$

$= \$16.50$

Store B

$5.76 \div 12 = \$0.48$ per apple

30 apples $= \$0.48 \times 30$

$= \$14.40$

Difference $= 16.50 - 14.40$

$= \$2.10$

∴ 30 apples would cost $2.10 less at Store B.

10) The ratio of the width to the height of a television screen is 16:9. If the height of the screen is 52 cm, determine the width of the screen.

$w \to \dfrac{16}{9} = \dfrac{x}{52} \leftarrow h$

$9x = 16 \times 52$

$9x = 832$

$x = \dfrac{832}{9}$

$x \doteq 92.4$ cm

11) Calculate the unit rate for each of the following.

a) 220 words typed in 4 minutes

b) $110 for 6 kg of cheese

c) 325 km driven in 4 hours

$220 \div 4 = 55$ words/minute   $110 \div 6 = \$18.33/kg$   $325 \div 4 = 81.25$ km/h

12) A bag of nuts contains 5 parts peanuts, 2 parts cashews, and 3 parts pecans.

   a) What is the ratio of cashews to peanuts to pecans?

$$2 : 5 : 3$$

   b) What fraction of the mixture is pecans?

Total parts = 2 + 5 + 3
         = 10

∴ fraction of mixture that
  is pecans is $\frac{3}{10}$

13) Mobo sold 8 cars in 15 days. How many cars would Mobo sell in 210 days?

cars → $\frac{8}{15} = \frac{x}{210}$     → $x = \frac{1680}{15}$

$15x = 8 \times 210$

$15x = 1680$          $x = 112$ cars

14) A 10 kg bag of firewood costs $27.50

   a) How much would you pay for a 25 kg bag?

kg → $\frac{10}{27.50} = \frac{25}{x}$     → $x = \frac{687.5}{10}$

$10x = 25 \times 27.50$

$10x = 687.5$          $x = \$68.75$

   b) How much could you buy for $55?

kg → $\frac{10}{27.50} = \frac{x}{55}$     → $x = \frac{550}{27.50}$

$27.50x = 10 \times 55$

$27.50x = 550$          $x = 20$ kg

15) Determine the volume of the figure shown below.
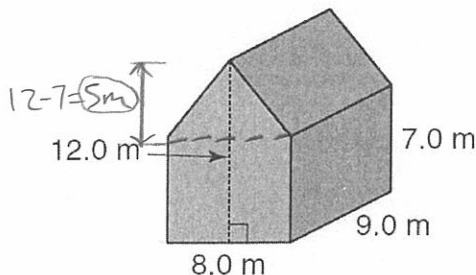
12 − 7 = 5m

12.0 m      7.0 m

9.0 m

8.0 m

Rectangular Prism
$$V = lwh$$
$$= (9)(8)(7)$$
$$= 504$$

Total = 504 + 180
      = 684 m³

Triangular Prism
$$V = \frac{bhl}{2}$$
$$= \frac{(8)(5)(9)}{2}$$
$$= 180$$

16) Consider the parallelogram shown on the right.


3 cm
5 cm
8 cm
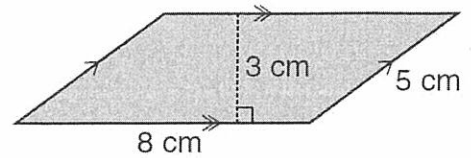
   a) Determine the perimeter of the parallelogram.

$$P = 8 + 5 + 8 + 5$$
$$= 26 \, cm$$

   b) Determine the area of the parallelogram.

$$A = bh$$
$$= (8)(3)$$
$$= 24 \, cm^2$$

   c) If the parallelogram shown is the face of a prism with length of 15 cm, determine the volume of the prism.

$$V = area \ of \ face \times length$$
$$= 24 \times 15$$
$$= 360 \, cm^3$$

17) Last week, Tenisha paid $65.72 for 62 kg of potatoes for her restaurant. Today, the price of potatoes is $0.02/kg lower. How much will Tenisha pay for 50 kg of potatoes today?

$$65.72 \div 62 = \$1.06 \ per \ kg$$

$$New \ price = 1.06 - 0.02$$
$$= \$1.04 \ per \ kg$$

$$Price \ for \ 50kg = \$1.04 \times 50$$
$$= \$52$$

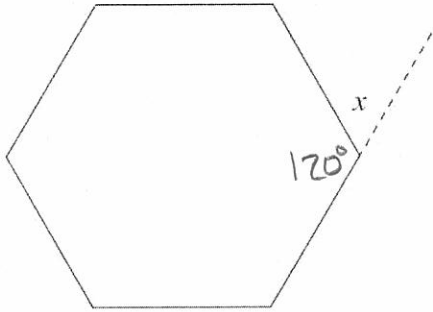18) Determine the value of angle $x$ in the diagram on the right.


146°  34°  $x$  34°

$$180° - 146° = 34°$$

$$180° - 34° - 34° = 112°$$

$$\therefore x = 112°$$

19) A regular hexagon with one side extended is shown.

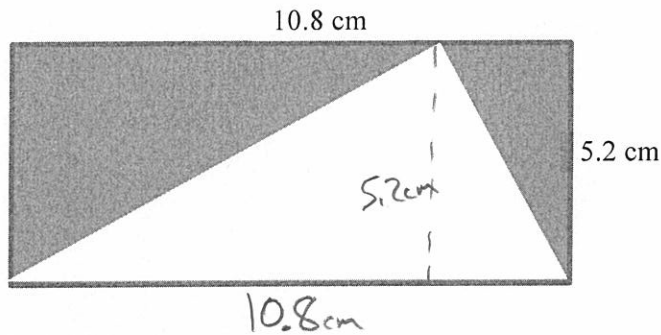What is the value of $x$?

6 sides $\Rightarrow$ 4 triangles

Angle total $= 4 \times 180°$
$= 720°$

$\therefore$ each interior angle is $\dfrac{720°}{6} = \underline{120°}$

$x = 180° - 120°$ (straight line)
$= 60°$

$\therefore x = 60°$

19) Determine the area of the shaded region in the following diagram.

10.8 cm

5.2 cm

5.2cm

10.8cm

Rectangle: $A = \ell w$
$= (10.8)(5.2)$
$= 56.16$

Triangle: $A = \dfrac{bh}{2}$
$= \dfrac{(10.8)(5.2)}{2}$
$= 28.08$

Shaded region $= 56.16 - 28.08 = 28.08 cm^2$

**A blast from the past...**

20) Jake is buying a new shirt for $34.99 plus tax. Determine the amount of tax (13% HST) Jake will have to pay.

$\dfrac{13}{100} = 0.13$

Tax $= 34.99 \times 0.13$
$= \$4.55$

21) A remote control helicopter starts at a height of 112 m and descends 3 m per second.
   a) Determine an equation to model the height of the helicopter.

$h = 112 - 3t$

   b) Use your equation to find the height of the helicopter after 17 seconds.

$h = 112 - 3(17)$
$h = 112 - 51$
$h = 61 m$