

*Answer Key*

Grade 9 Math  
Unit 1 Review for January Exam

**Multiple Choice**

Identify the choice that best completes the statement or answers the question.

- A 1. Determine the value of  $\sqrt{0.16}$ .  
 a. 0.4                      b. 0.07                      c. 0.2                      d. 0.04
- A 2. Calculate the number whose square root is 0.9.  
 a. 0.81                      b. 0.0081                      c. 0.081                      d. 0.09
- A 3. Which numbers are perfect squares?  
 i) 30.25    5.5  
 ii) 32    5.65685...  
 iii) 28.9    5.37587...  
 iv) 1.44    1.2  
 a. i and iv                      b. ii and iii                      c. i and ii                      d. i and iii
- B 4. Determine the value of  $\sqrt{\frac{72}{98}}$ .  $\sqrt{\frac{36}{49}}$   $\frac{6}{7}$   
 a.  $\frac{6}{14}$                       b.  $\frac{6}{7}$                       c.  $\frac{12}{7}$                       d.  $\frac{36}{49}$
- B 5. Name the two whole numbers whose squares are closest to 22.5.  
 a. 9, 25                      b. 4, 5                      c. 4, 9                      d. 16, 25  
 81 625                      16 25                      16 81                      256 625
- D 6. Name the two whole numbers whose squares are closest to  $\frac{595}{10}$ . 59.5  
 a. 49, 64                      b. 4, 9                      c. 16, 25                      d. 7, 8
- B 7. Estimate the value of  $\sqrt{0.35}$ , to the nearest tenth.  
 a. 0.5                      b. 0.6                      c. 0.59                      d. 0.9

a.  $\frac{6}{14}$       b.  $\frac{6}{7}$       c.  $\frac{12}{7}$       d.  $\frac{36}{49}$

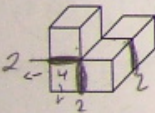
B 5. Name the two whole numbers whose squares are closest to 22.5.  
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D 6. Name the two whole numbers whose squares are closest to  $\frac{595}{10}$ . 59.5  
 a. 49, 64      b. 4, 9      c. 16, 25      d. 7, 8

B 7. Estimate the value of  $\sqrt{0.35}$ , to the nearest tenth.  
 a. 0.5      b. 0.6      c. 0.59      d. 0.9

D 8. A square has an area of  $24.8 \text{ cm}^2$ . Determine the side length of the square, to the nearest centimeter.  
 a. 4.98 cm      b. 4.9 cm      c. 5.0 cm      d. 5 cm  
 $\sqrt{24.8} \approx 4.97995$

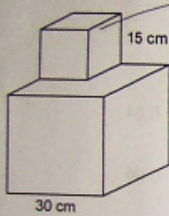
C 9. The lengths of the two legs of a right triangle are 6.7 cm and 3.2 cm. Determine the length of the hypotenuse to 1 decimal place.  
 a. 55.1 cm      b. 5.9 cm      c. 7.4 cm      d. 3.1 cm

D 10. This composite object is made using centimetre cubes. Determine its surface area.  
  
 1 cube = 6  
 $6 \times 4 = 24$   
 a.  $24 \text{ cm}^2$       b.  $20 \text{ cm}^2$       c.  $15 \text{ cm}^2$       d.  $18 \text{ cm}^2$   
 24 - overlap  
 24 - 6  
 18

$c^2 = a^2 + b^2$   
 $x^2 = 6.7^2 + 3.2^2$   
 $x^2 = 44.89 + 10.24$   
 $x^2 = 55.13$   
 $x = 7.4$

(i)

- C 11. This composite object is made of a 15-cm cube on top of a 30-cm cube. Determine its surface area.



Cube  
 $A = L \times w$   
 $= 15 \times 15$   
 $= 225$   
 $\times 6 \text{ sides}$   
 $\hline 1350$

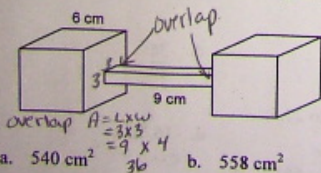
Cube  
 $A = L \times w$   
 $= 30 \times 30$   
 $= 900$   
 $\times 6 \text{ sides}$   
 $\hline 5400$

Overlap  
 $A = L \times w$   
 $= 15 \times 15$   
 $= 225$   
 $\times 2$   
 $\hline 450$

$1350 + 5400 - 450 = 6300$

- a. 6750 cm<sup>2</sup>      b. 5625 cm<sup>2</sup>      c. 6300 cm<sup>2</sup>      d. 6525 cm<sup>2</sup>

- D 12. This object is composed of two identical cubes joined by a right rectangular prism. The edge length of each cube is 6 cm. The rectangular prism is 9 cm long and has square ends of side length 3 cm. Determine the surface area of the object.



$\begin{array}{r} 216 \\ 216 \\ \hline 432 \\ - 36 \text{ overlap} \\ \hline 396 \end{array}$

Cube  
 $A = L \times w$   
 $= 6 \times 6$   
 $= 36$   
 $\times 6 \text{ sides}$   
 $\hline 216$

Cube identical  
 $\hline 216$

Top/Bottom	Front/Back	Side/End
$A = L \times w$ $= 9 \times 3$ $= 27 \times 2$ $= 54$	$A = L \times w$ $= 9 \times 3$ $= 27 \times 2$ $= 54$	$A = L \times w$ $= 3 \times 3$ $= 9 \times 2$ $= 18$

- a. 540 cm<sup>2</sup>      b. 558 cm<sup>2</sup>      c. 522 cm<sup>2</sup>      d. 324 cm<sup>2</sup>

The rectangular prism is 9 cm long and has square ends of side length 3 cm.  
Determine the surface area of the object.

Handwritten calculation for two cubes:

$$\begin{array}{r} 216 \\ 216 \\ \hline 558 \\ - 36 \text{ overlap} \\ \hline 522 \end{array}$$

Handwritten notes for cubes:

Cube  
 $A = L \times w = b \times b = 3 \times 3 = 9$   
 $\times 6 \text{ sides} = 216$

Cube identical = 216

Rect. Prism

Top/Bottom	Front/Back	Sides
$A = L \times w = 9 \times 3 = 27$	$A = L \times h = 9 \times 3 = 27$	$A = L \times w = 3 \times 3 = 9$
$\times 2 = 54$	$\times 2 = 54$	$\times 4 = 36$
126		

a.  $540 \text{ cm}^2$     b.  $558 \text{ cm}^2$     c.  $522 \text{ cm}^2$     d.  $324 \text{ cm}^2$

13. This object is composed of a cylinder of diameter 4 cm and height 14 cm on top of another cylinder of diameter 12 cm and height 4 cm.  
Determine the surface area of the object, to the nearest square centimeter.

Handwritten calculation for overlap:

$$\begin{array}{r} \text{Overlap} \\ \pi r^2 \\ (3.14)(2)^2 \\ (3.14)(4) \\ \hline 12.56 \times 2 \\ \hline 25.12 \end{array}$$

Handwritten calculations for cylinders:

Cylinder (small)  
 $SA = 2\pi r^2 + 2\pi rh$   
 $= 2(3.14)(2)^2 + 2(3.14)(2)(14)$   
 $= 2(3.14)(4) + 175.84$   
 $= 25.12 + 175.84$   
 $= 200.96$

Cylinder (large)  
 $SA = 2\pi r^2 + 2\pi rh$   
 $= 2(3.14)(6)^2 + 2(3.14)(6)(4)$   
 $= 2(3.14)(36) + 150.72$   
 $= 226.08 + 150.72$   
 $= 376.8$

Final calculation:

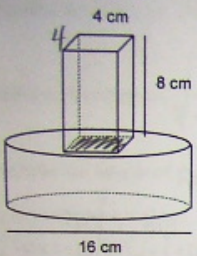
$$200.96 + 376.8 - 25.12 = 552.64$$

a.  $440 \text{ cm}^2$     b.  $557 \text{ cm}^2$     c.  $561 \text{ cm}^2$     d.  $553 \text{ cm}^2$



14. This object is composed of a rectangular prism on top of a cylinder. The rectangular prism has height 8 cm and square ends of side length 4 cm. The cylinder has diameter 16 cm and height 6 cm. Determine the surface area of the object, to the nearest square centimeter.

overlap  
 $A = L \times w$   
 $= 4 \times 4$   
 $= 16$   
 $\times 2$   
 $= 32$



Rectangular Prism

T/B	F/B	S/S
$A = L \times w$	$A = L \times w$	$A = L \times w$
$= 4 \times 4$	$= 8 \times 4$	$= 8 \times 4$
$= 16 \times 2$	$= 32 \times 2$	$= 32 \times 2$
$= 32$	$= 64$	$= 64$

160

Cylinder

$$SA = 2\pi r^2 + 2\pi rh$$

$$= 2(3.14)(8)^2 + 2(3.14)(8)(6)$$

$$= 2(3.14)(64) + 301.44$$

$$= 401.92 + 301.44$$

$$= 703.36$$

- $160 + 703.36 - 32 = 831.36$       **832**
- a.  $631 \text{ cm}^2$       b.  $816 \text{ cm}^2$       c.  **$832 \text{ cm}^2$**       d.  $848 \text{ cm}^2$

Short Answer

15. Determine the value of  $\sqrt{2.89}$ .      1.7

16. Determine the value of  $\sqrt{\frac{25}{36}}$ .       $\frac{5}{6}$

17. Determine the value of  $\sqrt{6 \times 3 \times 18}$ .       $\sqrt{324} = 18$

18. A square garden has an area of  $240.25 \text{ m}^2$ .  
 a) Determine the length of one side of the garden.  
 b) Determine the perimeter of the garden.

$15.5 \times 15.5 = 240.25$        $P = 62$

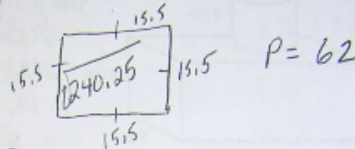
19. Determine the value of  $\sqrt{0.27}$ , to the nearest tenth

15. Determine the value of  $\sqrt{2.89}$ .  $1.7$

16. Determine the value of  $\sqrt{\frac{25}{36}}$ .  $\frac{5}{6}$

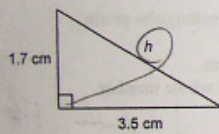
17. Determine the value of  $\sqrt{6 \times 3 \times 18}$ .  $\sqrt{324} = 18$

18. A square garden has an area of  $240.25 \text{ m}^2$ .  
 a) Determine the length of one side of the garden.  
 b) Determine the perimeter of the garden.



19. Determine the value of  $\sqrt{0.27}$ , to the nearest tenth.

20. Determine the length of the hypotenuse,  $h$ .  $0.52$



$$c^2 = a^2 + b^2$$

$$h^2 = 1.7^2 + 3.5^2$$

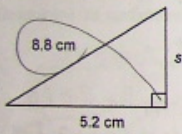
$$h^2 = 2.89 + 12.25$$

$$h^2 = 15.14$$

$$h = 3.89$$

(3)

21. Determine the length of side  $s$ .



$$c^2 = a^2 + b^2$$

$$8.8^2 = s^2 + 5.2^2$$

$$77.44 = s^2 + 27.04$$

$$50.4 = s^2$$

$$7.1 = s$$

22. This object is composed of a cube on top of a right rectangular prism. Determine the surface area of the object.

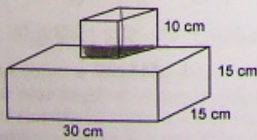
Overlap

$$A = L \times W$$

$$= 10 \times 10$$

$$= 100$$

$$\frac{\times 2}{200}$$



Cube

$$A = L \times W$$

$$= 10 \times 10$$

$$= 100 \times 6$$

$$= 600$$

Rec. Prism		
T/B	F/B	S/S
$A = L \times W$	$A = L \times W$	$A = L \times W$
$= 30 \times 15$	$= 30 \times 15$	$= 15 \times 15$
$= 450 \times 2$	$= 450 \times 2$	$= 225$
$= 900$	$= 900$	$\times 2$
		$= 450$

2250

$$600 + 2250 - 200 = 2650$$

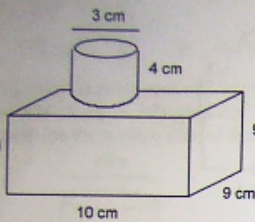
23. Determine the surface area of this composite object to the nearest...

$$600 + 2250 - 200 = 2650$$

$$2250$$

23. Determine the surface area of this composite object, to the nearest square centimeter.  
 The cylinder has diameter 3 cm and height 4 cm.  
 The prism has length 10 cm, width 9 cm, and height 9 cm.

Overlap  
 $A = \pi r^2$   
 $= (3.14)(1.5)^2$   
 $= (3.14)(2.25)$   
 $= 7.065 \times 2$   
 $= 14.13$



Cylinder  
 $SA = 2\pi r^2 + 2\pi rh$   
 $= 2(3.14)(1.5)^2 + 2(3.14)(1.5)(4)$   
 $= 2(3.14)(2.25) + 37.68$   
 $= 14.13 + 37.68$   
 $= 51.81$

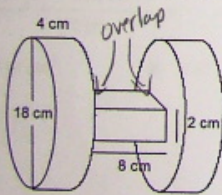
Rectangular Prism

T/B	F/B	S/S
$A = L \times W$	$A = L \times W$	$A = L \times W$
$= 10 \times 9$	$= 10 \times 9$	$= 9 \times 9$
$= 90$	$= 90$	$= 81$
$\times 2$	$\times 2$	$\times 2$
$= 180$	$= 180$	$= 162$
522		

$$51.81 + 522 - 14.13 = 559.68$$

24. This object is composed of two identical cylinders connected by a right rectangular prism.  
 Each cylinder has diameter 18 cm and height 4 cm.  
 The rectangular prism has length 8 cm and square ends of side length 2 cm.  
 Determine the surface area of the object. Give your answer to the nearest whole number.

Overlap  
 $A = L \times W$   
 $= 2 \times 2$   
 $= 4$   
 $\times 4$   
 $= 16$



Cylinder  
 $SA = 2\pi r^2 + 2\pi rh$   
 $= 2(3.14)(9)^2 + 2(3.14)(9)(4)$   
 $= 2(3.14)(81) + 226.08$   
 $= 508.68 + 226.08$   
 $= 734.76$

Identical

F/B	T/B	S/S
$A = L \times W$	$A = L \times W$	$A = L \times W$
$= 8 \times 2$	$= 8 \times 2$	$= 2 \times 2$
$= 16$	$= 16$	$= 4$
$\times 2$	$\times 2$	$\times 2$
$= 32$	$= 32$	$= 8$
72		

$$734.76 + 734.76 + 72 - 16 = 1525.52$$

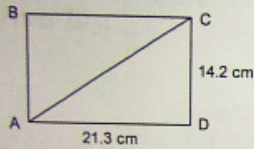
(4)



25. Determine the value of  $\sqrt{6.47+7.36+17.53} = \sqrt{31.36} = 5.6$

26. Determine the value of  $\sqrt{\frac{\sqrt{81} + \sqrt{49}}{\sqrt{196} - \sqrt{100}}} = \sqrt{\frac{9+7}{14-10}} = \sqrt{\frac{16}{4}} = \sqrt{4} = 2$

27. Determine the length of the diagonal AC of rectangle ABCD, to the nearest centimeter.



$$c^2 = a^2 + b^2$$

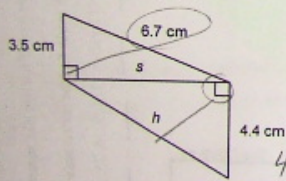
$$c^2 = 21.3^2 + 14.2^2$$

$$c^2 = 453.69 + 201.64$$

$$c^2 = 655.33$$

$$c = 25.6$$

28. Determine the values of  $s$  and  $h$ . Show your work.



(S)

$$c^2 = a^2 + b^2$$

$$6.7^2 = 3.5^2 + s^2$$

$$44.89 = 12.25 + s^2$$

$$32.64 = s^2$$

$$5.7 = s$$

(h)

$$c^2 = a^2 + b^2$$

$$h^2 = 4.4^2 + 5.7^2$$

$$h^2 = 19.36 + 32.49$$

$$h^2 = 51.85$$

$$h = 7.2$$