January Exam Review
Unit 1

Answers are on Slides 30 - 34

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1. Determine the value of $\sqrt{0.16}$
   a. 0.4 b. 0.07 c. 0.2 d. 0.04

$$\sqrt{\frac{16}{100}} = \frac{4}{10} = 0.4$$

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2. Calculate the number whose square root is 0.9.
   a. 0.81 b. 0.0081 c. 0.081 d. 0.09

$\sqrt{x} = 0.9$

$(\sqrt{x})^2 = (\frac{9}{10})^2$

$x = \frac{81}{100}$

$x = 0.81$

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3. Which numbers are perfect squares?
   i) 30.25
   ii) 32
   iii) 28.9
   iv) 1.44
   a. i and iv b. ii and iii c. i and ii d. i and iii

$\sqrt{\frac{3025}{100}}$

$\frac{55}{10}$

$\sqrt{\frac{32}{1}}$

$\frac{?}{1}$

$\sqrt{\frac{289}{10}}$

$\frac{17}{?}$

$\sqrt{\frac{144}{100}}$

$\frac{12}{10}$

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4. Determine the value of $\sqrt{\frac{72}{98}}$.

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

$\sqrt{\frac{72 \div 2}{98 \div 2}} = \sqrt{\frac{36}{49}} = \frac{6}{7}$

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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

$\sqrt{16}$ 22.5 $\sqrt{25}$

4 5

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6. Name the two whole numbers whose squares are closest to $\frac{595}{10}$.

a. 49, 64 b. 4, 9 c. 16, 25 d. 7, 8

$\frac{595}{10} = 59.5$

$\sqrt{49}$ 59.5 $\sqrt{64}$

7 8

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7. Estimate the value of $\sqrt{0.35}$, to the nearest tenth.

a. 0.5 b. 0.6 c. 0.59 d. 0.9

$\sqrt{0.35}$ closer

$\sqrt{0.25}$ $\sqrt{0.36}$

0.5 0.6

0.59

round to nearest tenth

0.6

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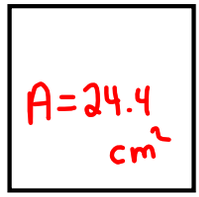
8. A square has an area of 24.8 cm^2.
Determine the side length of the square, to the nearest centimeter.
a. 4.98 cm b. 4.9 cm c. 5.0 cm d. 5 cm



side = $\sqrt{24.4}$

= 4.93

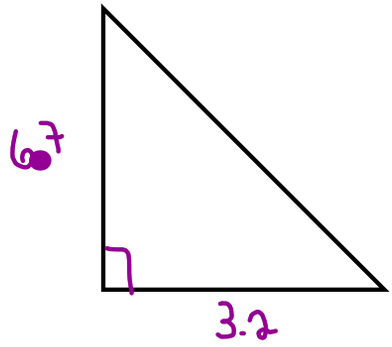
Nearest

cm

5cm

Jan 12-12:40 AM

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



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

$c^2 = 6.7^2 + 3.2^2$

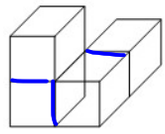
$c^2 = 44.89 + 10.24$

$\sqrt{c^2} = \sqrt{55.13}$

c = 7.4cm

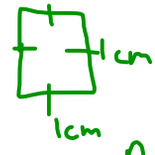
Jan 11-11:42 PM

10. This composite object is made using centimetre cubes. Determine its surface area.



3 overlaps = 6 faces

a. 24 cm^2 b. 20 cm^2 c. 15 cm^2 d. 18 cm^2



$A = 1\text{cm}^2$

4 cubes x 6 faces

= 24 faces − 6 faces

= 18 faces

x 1cm^2

18cm^2

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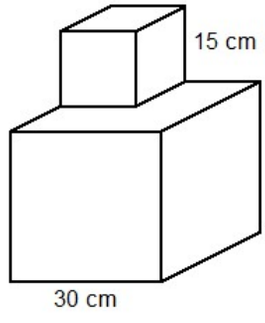
11. This composite object is made of a 15-cm cube on top of a 30-cm cube. Determine its surface area.



Small

$6(15 \times 15) = 1350\ \text{cm}^2$

Big

$6(30 \times 30) = 5400\ \text{cm}^2$

overlap

$2(15 \times 15) = 450\ \text{cm}^2$

a. 6750 cm^2 b. 5625 cm^2 c. 6300 cm^2 d. 6525 cm^2

1350 + 5400 − 450

= 6300 cm^2

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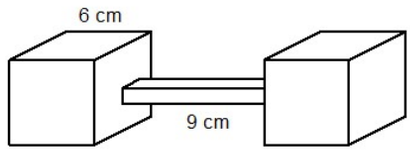
12. This object is composed of two identical cubes joined by a right rectangular prism.
The edge length of each cube is 6 cm.
The rectangular prism is 9 cm long and has square ends of side length 3 cm.
Determine the surface area of the object.



4, 3, 3

a. 540 cm² b. 558 cm² c. 522 cm² d. 324 cm²

2 (Cubes) + (rect prism) − 2overlaps

12 (6x6) + (2(4x3)+2(4x3)+2(3x3)) − 4(3x3)

432cm² + 126 cm² − 36 cm²

= 522 cm²

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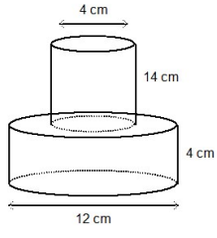
13. This object is composed of a cylinder of diameter 4 cm and height 14 cm on top of another cylinder of diameter 12 cm and height 4 cm.
Determine the surface area of the object, to the nearest square centimeter.



a. 440 cm² b. 557 cm² c. 561 cm² d. 553 cm²

Big

$SA = 2\pi(6)^2 + 2\pi(6)(4)$

$SA = 226.08 + 150.72$

$SA = 376.8$

Sm

$SA = 2\pi(2)^2 + 2\pi(2)(14)$ (overlap)

$SA = 2\pi(2)(14)$

$SA = 175.84$

$TSA = 376.8 + 175.84$

$552.6\ cm^2$

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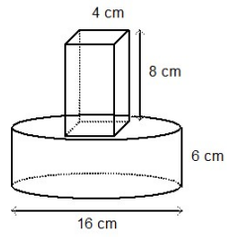
14. This object is composed of a rectangular prism on top of a cylinder.
The rectangular prism has height 8 cm and square ends of side length 4 cm.
The cylinder has diameter 16 cm and height 6 cm.
Determine the surface area of the object, to the nearest square centimeter.



a. 631 cm^2 b. 816 cm^2 c. 832 cm^2 d. 848 cm^2

Cylinder

$SA = 2\pi(8)^2 + 2\pi(8)(6)$

$SA = 401.92 + 301.44$

$SA = 703.36\ cm^2$

Prism 8, 4, 4 (overlap)

$2(8\times4) + 2(8\times4) + 2(4\times4)$

$64 + 64 + 32$

$= 160\ cm^2$

$703.36 + 160 - 32$

$= 831.4\ cm^2$

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

$\sqrt{\frac{289}{100}} = \frac{17}{10}$

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

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

$\sqrt{18 \times 18}$ or $\sqrt{18^2}$

$\sqrt{324}$

$= 18$ $= 18$

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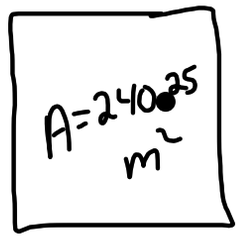
18. A square garden has an area of 240.25 m^2.
    a) Determine the length of one side of the garden.
    b) Determine the perimeter of the garden.

a)



side $= \sqrt{240.25}$

$= 15.5$ cm

b) $P = 4(15.5)$

$= 62$ cm

or

$P = 15.5 + 15.5 + 15.5 + 15.5$

$= 62$ cm

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

closer

$\sqrt{0.27}$

$\sqrt{0.25}$ $\sqrt{0.36}$

$\sqrt{\frac{25}{100}}$ $\sqrt{\frac{36}{100}}$

$\frac{5}{10}$ $\frac{6}{10}$

0.5 0.52 0.6

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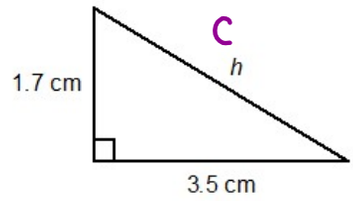
20. Determine the length of the hypotenuse, h.



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

$c^2 = 1.7^2 + 3.5^2$

$c^2 = 2.89 + 12.25$

$\sqrt{c^2} = \sqrt{18.03}$

$c \approx 4.2\text{cm}$

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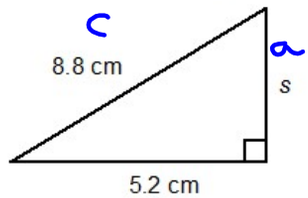
21. Determine the length of side s.



$a^2 = c^2 - b^2$

$a^2 = 8.8^2 - 5.2^2$

$a^2 = 77.44 - 27.04$

$\sqrt{a^2} = \sqrt{50.4}$

$a = 7.1\text{ cm}$

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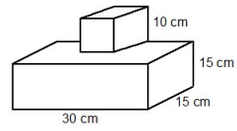
22. This object is composed of a cube on top of a right rectangular prism. Determine the surface area of the object.



Cube

10 | 6 | 10

A = bxh
A = 10 x10
A = 100 cm²
6A = 600 cm²

Prism (30, 15,15)

30 | 2 | 15 — A = bxh — A= 30×15 — A= 450 — 2A= 900

30 | 2 | 15 — A = bxh — A= 30×15 — A= 450 — 2A= 900

15 | 2 | 15 — A = bxh — A= 15×15 — A= 225 — 2A= 450

sa=900 + 900 + 450

= 2250 cm²

Tsa = Cube + Prism - overlap

= 600 + 2250 - 200

= 2650 cm²

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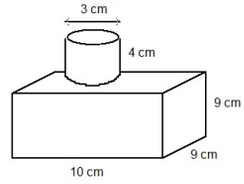
23. Determine the surface area of this composite object, to the nearest square centimeter.
The cylinder has diameter 3 cm and height 4 cm.
The prism has length 10 cm, width 9 cm, and height 9 cm.



Cylinder Overlap

SA= 2πr² + 2πrh

SA = 2π(1.5)² + 2π(1.5)(4)

SA = 14.13 + 37.68

SA = 51.81 cm²

Prism (10, 9,9)

10 | 2 | 9 — A = bxh — A= 10×9 — A= 90 — 2A= 180

10 | 2 | 9 — A = bxh — A= 10×9 — A= 90 — 2A= 180

9 | 2 | 9 — A = bxh — A= 9×9 — A=81 — 2A= 162

sa=180 + 180 + 162

= 522 cm²

Tsa = Cylinder + Prism - overlap

= 50.81 + 522 - 14.13

= 559.68 cm²

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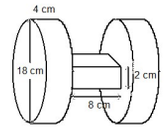
24. This object is composed of two identical cylinders connected by a right rectangular prism.
Each cylinder has diameter 18 cm and height 4 cm.
The rectangular prism has length 8 cm and square ends of side length 2 cm.
Determine the surface area of the object. Give your answer to the nearest whole number.



2 Cylinder
$SA = 2\pi r^2 + 2\pi rh$
$SA = 2\pi(9)^2 + 2\pi(9)(4)$
$SA = 508.68 + 226.08$
$SA = 734.76$
$\times 2$
$1469.52\ cm^2$

Prism (8, 2,2)

8 | 2 | 2
A = bxh
A= 8 x 2
A= 16
2A= 32

8 | 2 | 2
A = bxh
A= 8 x 2
A= 16
2A= 32

2 | 2 | 2
A = bxh
A= 2 x 2
A=4
2A= 8

sa= 32 + 32+ 8
= 72 cm^2

Tsa = Cylinder + Prism - overlap - overlap
= 1469.52 + 72 - 8 - 8
= 1525.52 cm^2

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

$\sqrt{31.36}$

$= 5.6$

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26. Determine the value of $\sqrt{\frac{\sqrt{81}+\sqrt{49}}{\sqrt{196}-\sqrt{100}}}$.

$$\sqrt{\frac{9+7}{14-10}} = \sqrt{\frac{16}{4}}$$

$$= \frac{4}{2}$$

$$= 2$$

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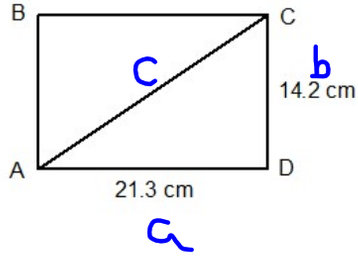
27. Determine the length of the diagonal AC of rectangle ABCD, to the nearest centimeter.



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

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

$c^2 = 453.69 + 201.64$

$\sqrt{c^2} = \sqrt{655.33}$

$c = 25.6 \text{ cm}$

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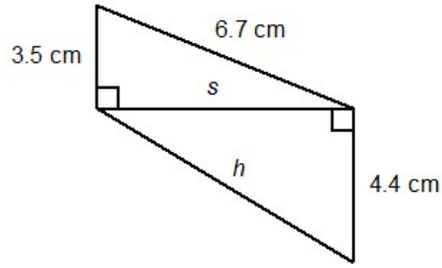
28. Determine the values of s and h. Show your work.



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Unit 1 Review for January Exam
Answer Section

MULTIPLE CHOICE

PTS: 1 DIF: Easy REF: 1.1 Square Roots of Perfect Squares
LOC: 9.N5 TOP: NumberKEY: Procedural Knowledge

PTS: 1 DIF: Easy REF: 1.1 Square Roots of Perfect Squares
LOC: 9.N5 TOP: NumberKEY: Procedural Knowledge

PTS: 1 DIF: Moderate REF: 1.1 Square Roots of Perfect Squares
LOC: 9.N5 TOP: NumberKEY: Conceptual Understanding

PTS: 1 DIF: Moderate REF: 1.1 Square Roots of Perfect Squares
LOC: 9.N5 TOP: NumberKEY: Procedural Knowledge

PTS: 1 DIF: Easy
REF: 1.2 Square Roots of Non-Perfect Squares LOC: 9.N6
TOP: NumberKEY: Conceptual Understanding

PTS: 1 DIF: Easy
REF: 1.2 Square Roots of Non-Perfect Squares LOC: 9.N6
TOP: NumberKEY: Conceptual Understanding

PTS: 1 DIF: Moderate
REF: 1.2 Square Roots of Non-Perfect Squares LOC: 9.N6
TOP: NumberKEY: Procedural Knowledge

PTS: 1 DIF: Moderate
REF: 1.2 Square Roots of Non-Perfect Squares LOC: 9.N6
TOP: NumberKEY: Procedural Knowledge

PTS: 1 DIF: Moderate
REF: 1.2 Square Roots of Non-Perfect Squares LOC: 9.N6
TOP: NumberKEY: Procedural Knowledge

PTS: 1 DIF: Easy
REF: 1.3 Surface Areas of Objects Made from Right Rectangular Prisms
LOC: 9.SS2 TOP: Shape and Space (3-D Objects and 2-D Shapes)
KEY: Procedural Knowledge

PTS: 1 DIF: Moderate
REF: 1.3 Surface Areas of Objects Made from Right Rectangular Prisms
LOC: 9.SS2 TOP: Shape and Space (3-D Objects and 2-D Shapes)
KEY: Procedural Knowledge

PTS: 1 DIF: Easy
REF: 1.4 Surface Areas of Other Composite Objects LOC: 9.SS2
TOP: Shape and Space (3-D Objects and 2-D Shapes) KEY: Procedural Knowledge

PTS: 1 DIF: Easy
REF: 1.4 Surface Areas of Other Composite Objects LOC: 9.SS2
TOP: Shape and Space (3-D Objects and 2-D Shapes) KEY: Procedural Knowledge

PTS: 1 DIF: Easy
REF: 1.4 Surface Areas of Other Composite Objects LOC: 9.SS2
TOP: Shape and Space (3-D Objects and 2-D Shapes) KEY: Procedural Knowledge

Jan 12-12:01 AM

SHORT ANSWER

ANS:

PTS: 1 DIF: Easy REF: 1.1 Square Roots of Perfect Squares
LOC: 9.N5 TOP: Number KEY: Procedural Knowledge

PTS: 1 DIF: Easy REF: 1.1 Square Roots of Perfect Squares
LOC: 9.N5 TOP: Number KEY: Procedural Knowledge

ANS:

PTS: 1 DIF: Moderate REF: 1.1 Square Roots of Perfect Squares
LOC: 9.N5 TOP: Number KEY: Procedural Knowledge

a) The length of one side of the garden is $\sqrt{240.25}$ m, or
b) The perimeter of the garden is 4×15.5 m,

PTS: 1 DIF: Moderate REF: 1.1 Square Roots of Perfect Squares
LOC: 9.N5 TOP: Number KEY: Procedural Knowledge

PTS: 1 DIF: Easy REF: 1.2 Square Roots of Non-Perfect Squares
LOC: 9.N6 TOP: Number KEY: Procedural Knowledge

Jan 12-12:24 AM

The length of the hypotenuse is abou

PTS: 1 DIF: Moderate REF: 1.2 Square Roots of Non-Perfect Squares
LOC: 9.N6 TOP: Number KEY: Procedural Knowledge

The length of side *s* is abou n.

PTS: 1 DIF: Moderate REF: 1.2 Square Roots of Non-Perfect Squares
LOC: 9.N6 TOP: Number KEY: Procedural Knowledge

The surface area of the composite object is

PTS: 1 DIF: Moderate
REF: 1.3 Surface Areas of Objects Made from Right Rectangular Prisms
LOC: 9.SS2 TOP: Shape and Space (3-D Objects and 2-D Shapes)
KEY: Procedural Knowledge

S:
The surface area of the object is abou .

PTS: 1 DIF: Moderate REF: 1.4 Surface Areas of Other Composite Objects
LOC: 9.SS2 TOP: Shape and Space (3-D Objects and 2-D Shapes)
KEY: Procedural Knowledge

The surface area of the object is about .

PTS: 1 DIF: Moderate REF: 1.4 Surface Areas of Other Composite Objects
LOC: 9.SS2 TOP: Shape and Space (3-D Objects and 2-D Shapes)
KEY: Procedural Knowledge

Jan 12-12:25 AM

PROBLEM

ANS:

$$\sqrt{6.47 + 7.36 + 17.53} = \sqrt{31.36}$$

PTS: 1 DIF: Moderate REF: 1.1 Square Roots of Perfect Squares
LOC: 9.N5 TOP: Number KEY: Problem-Solving Skills

S:

$$\sqrt{\frac{\sqrt{81} + \sqrt{49}}{\sqrt{196} - \sqrt{100}}} = \sqrt{\frac{9 + 7}{14 - 10}}$$

$$= \sqrt{\frac{16}{4}}$$

PTS: 1 DIF: Difficult REF: 1.1 Square Roots of Perfect Squares
LOC: 9.N5 TOP: Number KEY: Problem-Solving Skills

ANS:

$$AC^2 = AD^2 + DC^2$$
$$= 21.3^2 + 14.2^2$$
$$= 655.33$$
$$AC = \sqrt{655.33}$$

The length of AC is about 25.6 cm.

PTS: 1 DIF: Moderate REF: 1.2 Square Roots of Non-Perfect Squares
LOC: 9.N6 TOP: Number KEY: Problem-Solving Skills

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ANS:

Use the Pythagorean Theorem.

$$s^2 + 3.5^2 = 6.7^2$$
$$s^2 = 6.7^2 - 3.5^2$$
$$s^2 = 32.64$$
$$s = \sqrt{32.64}$$

$$h^2 = s^2 + 4.4^2$$
$$= 32.64 + 19.36$$
$$= 52$$
$$h = \sqrt{52}$$

Side s is about 5.7 cm and side h is about 7.2 cm.

PTS: 1 DIF: Difficult REF: 1.2 Square Roots of Non-Perfect Squares
LOC: 9.N6 TOP: Number KEY: Problem-Solving Skills | Communication

Jan 12-12:28 AM