

**Get a Math Exam Review Binder (small)
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Chapter 1 Skills Summary

1. Skill: Convert within and between systems of measurement.

Strategy: Unit analysis (set up conversion factors so that units cancel out properly)

Examples:

a) Convert 2 mi. to feet.

$$\frac{2 \text{ mi}}{1} \cdot \frac{1760 \text{ yd}}{1 \text{ mi}} \cdot \frac{3 \text{ ft}}{1 \text{ yd}} = 10560 \text{ ft}$$

b) Convert 62 in. to yards, feet and inches.

* Deal with largest unit of measure first.

$$\frac{62 \text{ in}}{1} \cdot \frac{1 \text{ ft}}{12 \text{ in}} \cdot \frac{1 \text{ yd}}{3 \text{ ft}} = 1.7\bar{2} \text{ yd}$$

$$0.7\bar{2} \text{ yd} \cdot \frac{3 \text{ ft}}{1 \text{ yd}} = 2.1\bar{6} \text{ ft}$$

$$0.1\bar{6} \text{ ft} \cdot \frac{12 \text{ in}}{1 \text{ ft}} = 2 \text{ in}$$

c) Convert 6 ft. 2 in. to centimetres.

$$6 \text{ ft} \cdot \frac{12 \text{ in}}{1 \text{ ft}} = 72 \text{ in}$$

$$72 \text{ in} + 2 \text{ in} = 74 \text{ in}$$

$$74 \text{ in} \cdot \frac{2.54 \text{ cm}}{1 \text{ in}} = 187.96 \text{ cm}$$

1 yd	2 ft	2 in
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2. Skill: Use referents to estimate a length, choose an appropriate measuring instrument and unit.

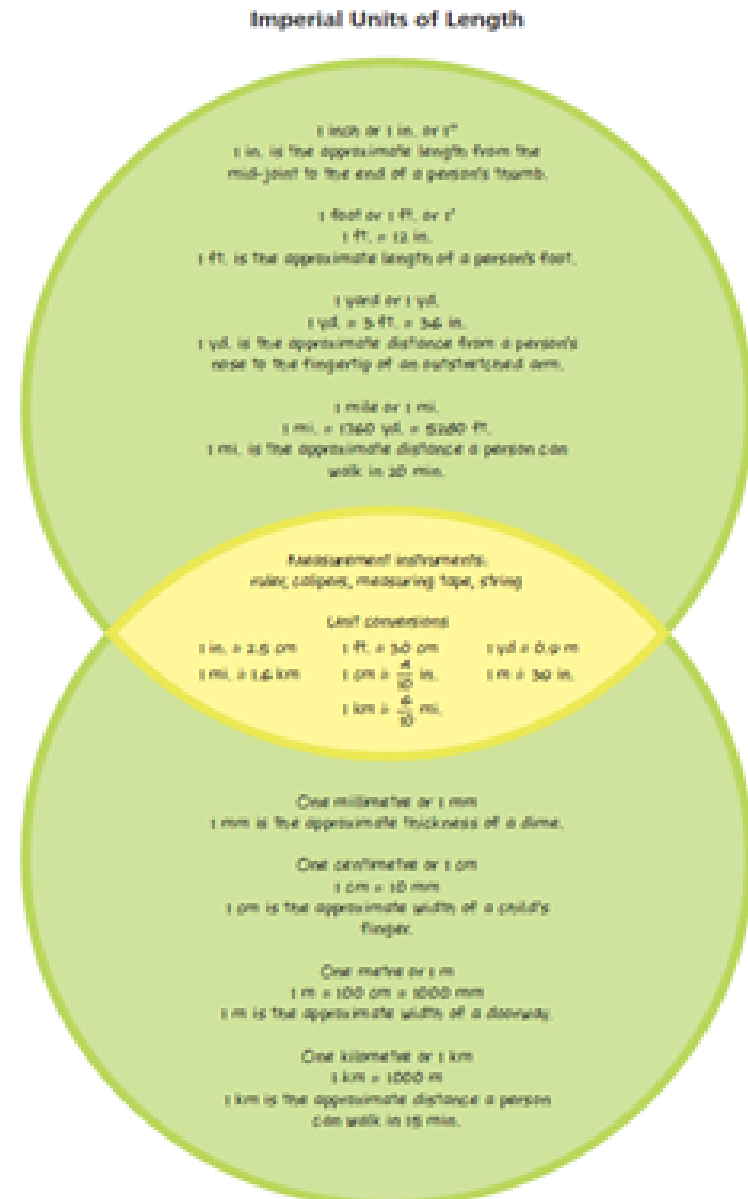
Strategy: see page 24

Review this

2. Skill:

Use referents to estimate a length, choose an appropriate measuring instrument and unit.

Strategy: see page 24



3. Skill: Calculate the surface area of a right prism, pyramid, cylinder, cone, or sphere

Strategy: To determine surface area:

1. Identify the faces that comprise the surface area
2. Calculate the area of each face
3. Add the areas

Add up all the sides!

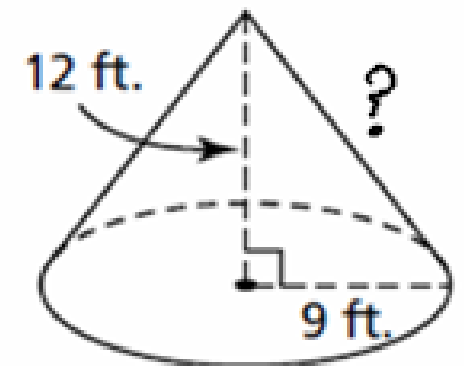
You may need to use the Pythagorean Theorem to determine any dimension that is not given.

* Be careful not to just rely on formulas.

Example: Determine the surface area of this cone to the nearest square foot.

$$\begin{aligned} SA &= \pi r^2 + \pi r s \\ &= \pi (9)^2 + \pi (9)(15) \\ &= 678.5840 \text{ ft}^2 \end{aligned}$$

$$= 679 \text{ ft}^2$$



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

$$9^2 + 12^2 = c^2$$

$$\sqrt{9^2 + 12^2} = c$$

$$15 = c$$

4. Skill: Calculate the volume of a right prism, pyramid, cylinder, cone, or sphere.

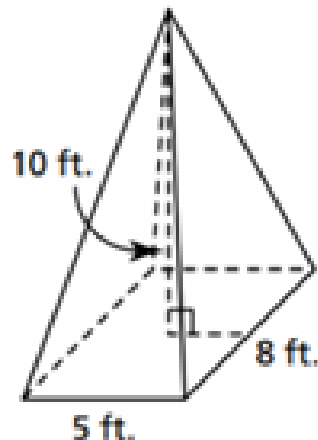
Strategy: To determine volume.

1. Identify the object.
2. Use a formula to determine the volume of each object.

You may need to use the Pythagorean Theorem to determine any dimension that is not given.

* if SA \rightarrow Rec based pyramid you need to develop formul.

Example: a) Determine the volume of this right rectangular pyramid to the nearest cubic foot.



$$\begin{aligned}V &= \frac{1}{3} A_b h \\&= \frac{1}{3} (l \cdot w) h \\&= \frac{1}{3} (5 \cdot 8) (10) \\&= 133.\bar{3} \text{ ft}^3\end{aligned}$$

$$V = 133 \text{ ft}^3$$

- b) Calculate the diameter of the following right cone to the nearest tenth of a centimetre.

$$V = 164.9 \text{ cm}^3$$

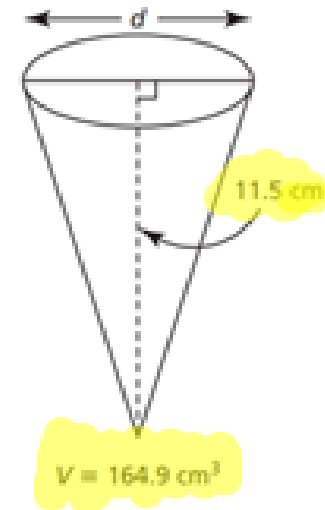
$$h = 11.5 \text{ cm}$$

$$V = \frac{1}{3} \pi r^2 h$$

$$164.9 = \frac{1}{3} \pi r^2 (11.5)$$

$$\frac{494.7}{\pi (11.5)} = \frac{\pi r^2 (11.5)}{\pi (11.5)}$$

$$\sqrt{\frac{494.7}{\pi (11.5)}} = \sqrt{r^2}$$



$$\frac{3 \rightarrow 1}{1 \rightarrow 3} = \frac{3}{3}$$

$$r = 3.7004 \text{ cm}$$

$$d = 2r$$

$$= 7.4 \text{ cm}$$

$$2^{\text{nd}} \rightarrow x^2 \rightarrow (494.7) \div (11.5\pi)$$

5. Skill: Calculate the surface area or volume of a composite object (two or more objects together).

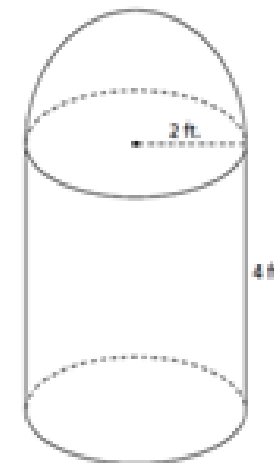
Strategy: Calculate the volume/surface area of each individual object (be careful not to include unexposed faces when calculating the surface area of composites) and add them together.

Example:

Determine the surface area and volume of this composite object to the nearest square/cubic foot.

$$\begin{aligned} SA &= \pi r^2 + 2\pi rh + \frac{1}{2} (4\pi r^2) \\ &= \pi(2)^2 + 2\pi(2)(4) + 2\pi(2)^2 \\ &= 87.9646 \text{ ft}^2 \end{aligned}$$

$$SA = 88 \text{ ft}^2$$



$$\begin{aligned} V &= \pi r^2 h + \frac{1}{2} \left(\frac{4}{3} \pi r^3 \right) \\ &= \pi(2)^2(4) + \frac{4}{6} \pi(2)^3 \\ &= 67.0206 \text{ ft}^3 \end{aligned}$$

$$V = 67 \text{ ft}^3$$

"Level C" questions:

-you HAVE the skills to solve them

-not one-step/plug+chug problems

-multiple steps OR think (a little!) outside the box!

1. A cylinder has a surface area of 1220 cm^2 . What is the height of this cylinder (to the nearest tenth of a cm) if the height is 4 times the size of the radius?

$$SA = 1220 \text{ cm}^2 \quad h = 4r$$

$$* SA = 2\pi r^2 + 2\pi r(4r)$$

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

$$1220 = 2\pi r^2 + 8\pi r^2$$

$$1220 = 10\pi r^2$$

$$\sqrt{\frac{1220}{10\pi}} = r$$

$$6.2317 \text{ cm} = r \text{ then}$$

find
height

2. How many pieces of baseboard are needed to go around this room (baseboard comes in 6 ft lengths)?

