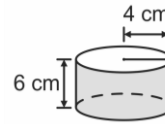


REVIEW

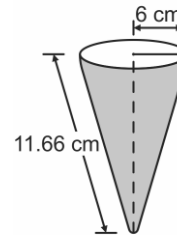
1. Sophie works in a chocolate boutique. To make chocolate mousse, she must mix melted chocolate and cream in a pot. One “surprise of the week” toy will be thrown into this mixture.

Sophie must then pour the mixture into 4 different types of containers.

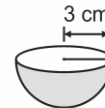
Type A container is in the shape of a cylinder with a height of 6 cm and a radius of 4 cm.



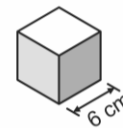
Type B container is in the shape of a right cone with a radius of 6 cm and a slant height of 11.66 cm.



Type C container is in the shape of a half sphere with a radius of 3 cm.



Type D container is in the shape of a cube with 6 cm sides.



Sophie must fill 40 type A containers, 52 type B containers, 30 type C containers, and 24 type D containers with the mixture.

Given the volume of each container, what is the probability that the surprise toy will be in a type A or type B container?

2. Using the laws of exponents, show that the following expression is true.

$$\frac{\left((a^3 \cdot b^5)^8\right)^{\frac{1}{2}} \cdot (a^2 \cdot c^3)^5 \cdot (c^5 \cdot b)^{-2} \cdot a^3}{(a^3 \cdot c^{-1})^{-5} \cdot (b^2)^{-7} \cdot \left((b^4 \cdot a^5)^{24}\right)^{\frac{1}{3}}} = 1$$

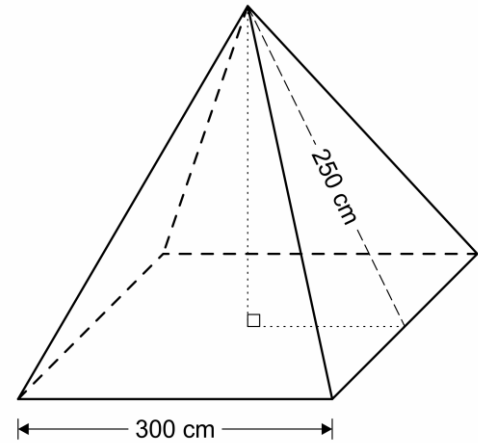
REVIEW

3. Geotown is holding a summer festival. One of the activities includes making sand castles. Samuel decided to create a miniature pyramid.

Samuel's creation is made of sand and is in the shape of a square-based pyramid.

The side of the square base measures 300 centimetres and the slant height of the pyramid measures 250 centimetres.

Sand is purchased in packs of 1 m^3 .

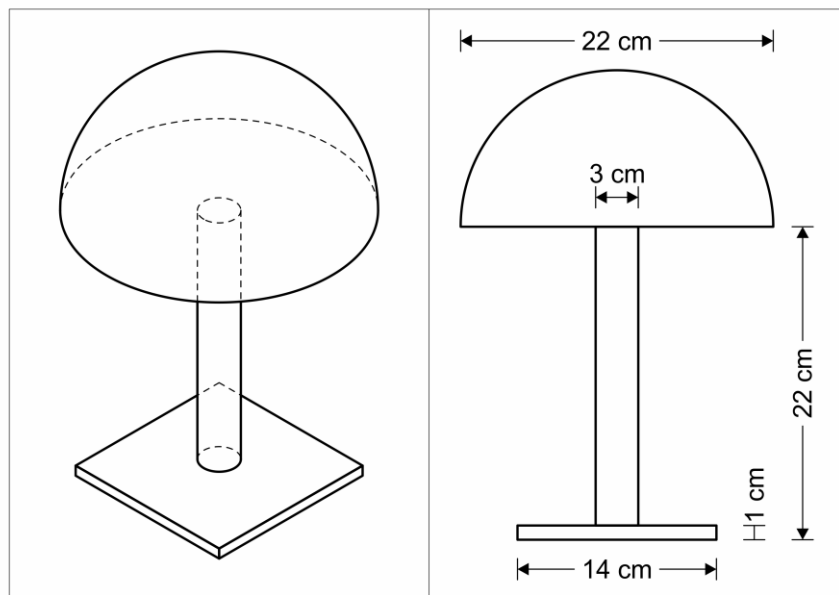


How many packs of sand will Samuel need to build his sand castle?

4. Shelly is in the process of redecorating her room. She is on a tight budget, so she has decided to shop for inexpensive items at a local garage sale. She comes across the lamp shown below. The lamp pieces are permanently glued together (cannot be taken apart).

She likes the style of the lamp, but wants to improve its appearance by:

- painting all of the sides of the square base excluding the bottom;
- painting the lateral area of cylindrical pole;
- painting the outside of the hemispherical lamp shade a new colour.



What is the total surface area that Shelly will be painting?

REVIEW

5. Given that:

$$A = \frac{14x^4 - 10x^3 + 8x}{2x}$$

$$B = (2x^2 - 3x)(4x + 1)$$

$$C = 13x^3 - 9x^2 + 7x - 2 + 2x^2 - 3x - 6$$

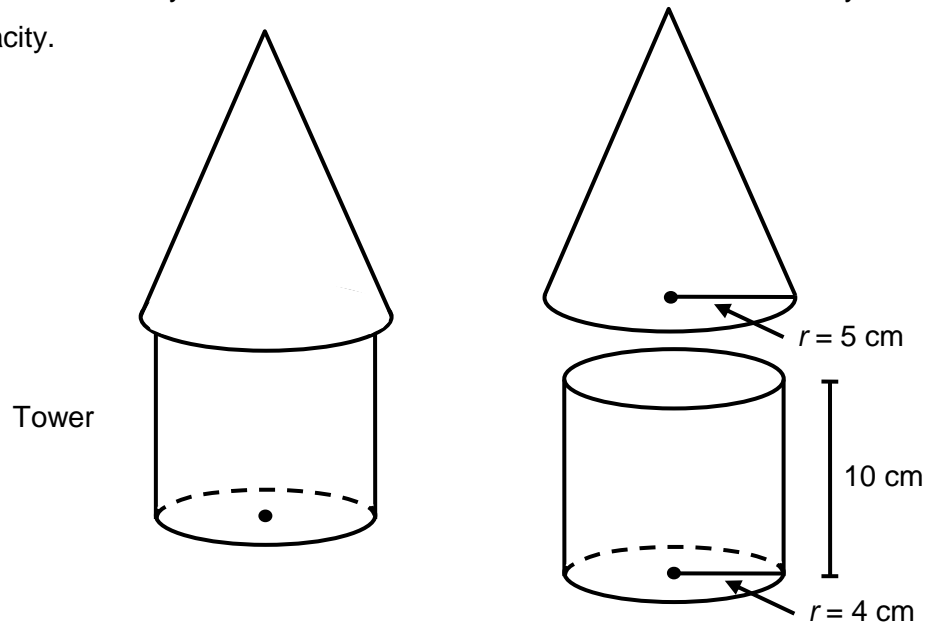
$$D = (4x^3 + x^2 - 9x) - (3x^3 - 5x^2 - 1)$$

What is the simplified expression of $A + 2B - 3C + D$?

6. Tommy has been given an art project to make a sculpture with Hydro-Rock. The liquid form of Hydro-Rock is poured into a mould; once it hardens, it is removed from the mould.

Tommy is permitted to use a maximum of 1.25 L of Hydro-Rock. In order for his sculpture to fit in the display case, his sculpture must not exceed 30 cm in height.

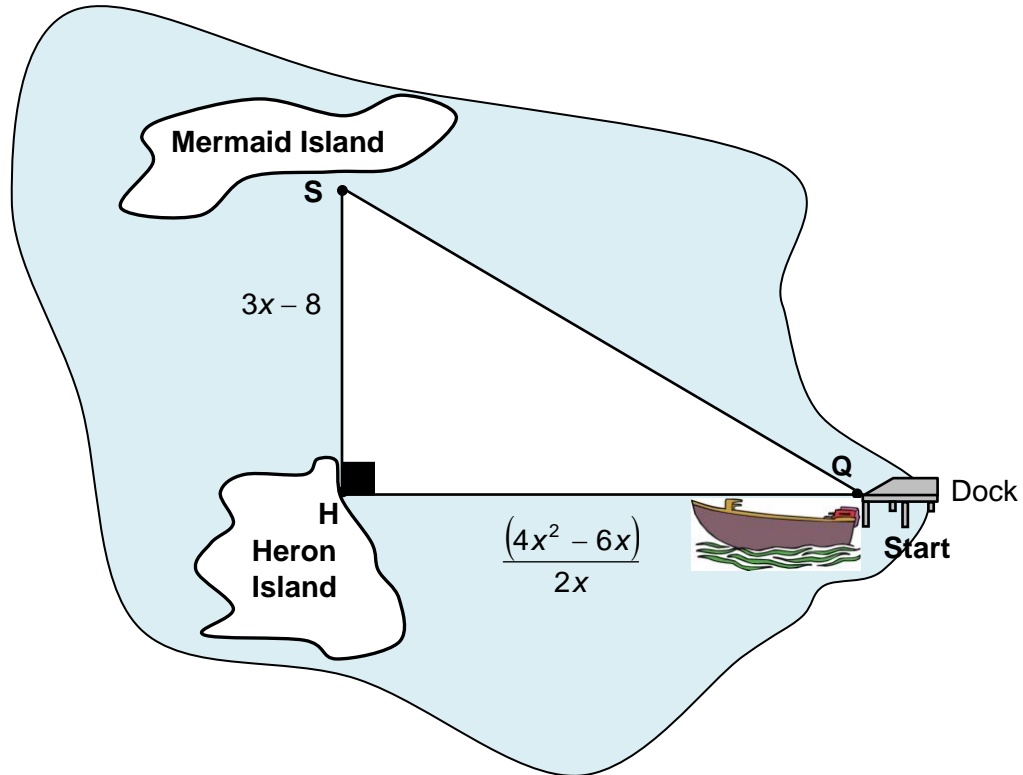
He decides to use a cone and cylinder to make a small tower. The cone and the cylinder have the same capacity.



Tommy thinks his sculpture will use less than 1.25 L of Hydro-Rock and will not exceed 30 cm in height. **Is he correct?**

REVIEW

7. Christine and Rachel meet on the dock to start their day of fishing. They decide to fish near Heron Island, which is $\frac{(4x^2 - 6x)}{2x}$ km from the dock. They fish for a few hours without success. They decide to change locations and go near Mermaid Island, which is $(3x - 8)$ km from Heron Island. They have now travelled a total of 9 km. At the end of the day they take the shortest route to return to the dock.

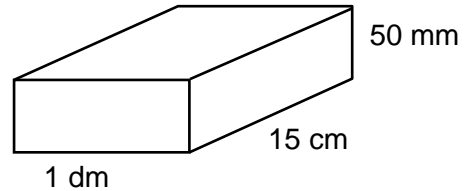


How many kilometres do they travel to return to the dock?

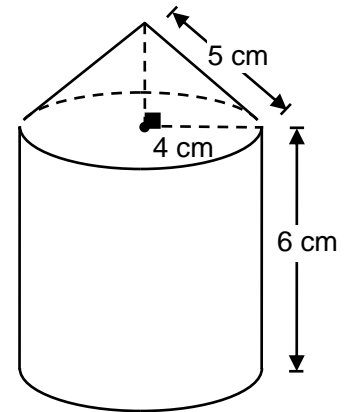
REVIEW

8. Kelly's new hobby is candle-making. She wants to make a beautiful assortment of candles for Jade's mantle.

She buys 5 blocks of wax measuring 1 dm by 15 cm by 50 mm.



She wants to make 3 candles, formed in the shape of a cylinder topped by a cone, as the one shown below.

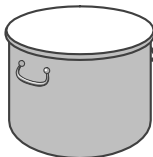


She uses the rest of the wax to make spherical candles. The spherical candles will have the same radius as the cylinder and the cone. **How many spherical candles can Kelly make?**

9. Ms. Greco will be making more tomato sauce, but her current pot is too small. She is planning to replace it with a larger, similar pot. Both pots are in the shape of a cylinder.

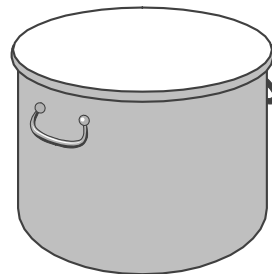
The area of the base of her current pot is 208 cm^2 and its height is 20 cm. The area of the base of her new pot is 468 cm^2 .

CURRENT POT



Area of the base = 208 cm^2
 $h = 20 \text{ cm}$

NEW POT



Area of the base = 468 cm^2

Ms. Greco stores her tomato sauce in jars that each hold 640 mL of sauce.

How many more full jars of tomato sauce will Ms. Greco be able to fill using her new pot compared to the current pot?

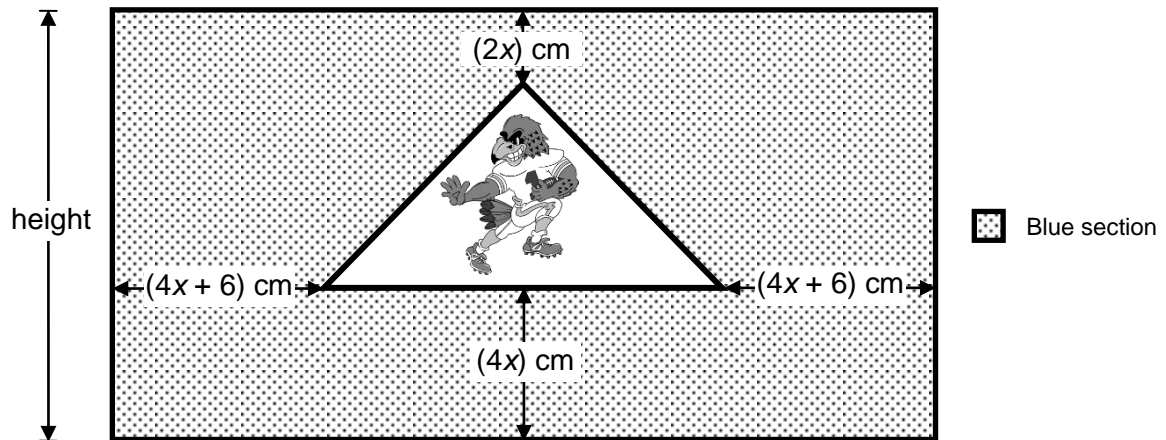
REVIEW

10. The marketing department of the local football team is making new flags. Each flag consists of an isosceles triangle inside a rectangle. The team's logo is inside the triangle. The area outside the triangle is blue.

The flag has a total area of $(96x^3 + 64x^2 + 80x)$ cm².

The height of the flag corresponds to the greatest common factor of its area.

Some of the dimensions of the flag are given in the diagram below.



What simplified algebraic expression represents the area of the blue section of the flag?