YEAR 10 MATHEMATICS

Students in 10A and 9X Mathematics spent a couple of lessons engaging in challenging HSC style problems to consolidate their understanding of volume and surface area of three-dimensional solids.

These students enjoy a challenge and were very positive in their approach to these problems, collaborating effectively with one another as they were encouraged to be critical thinkers and resilient learners.

Here's a problem they worked on together. Can you solve it?
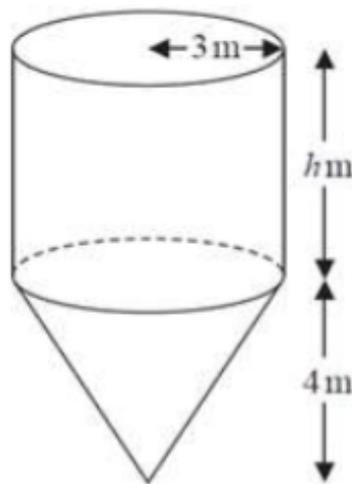
The diagram shows a container for grain.

Diagram **NOT** accurately drawn

3 m

h m

4 m

The container is a cylinder on top of a cone.
The cylinder has a radius of 3 m and a height of h m.
The cone has a base radius of 3 m and a vertical height of 4 m.

The container is empty.
The container is then filled with grain at a constant rate.

After 5 hours the depth of the grain is 6 metres above the vertex of the cone.
After 9 hours the container is full of grain.

Work out the value of h .
Give your answer as a fraction in its simplest form.
You must show all your working.