Math 4161

- Grade 9 Mathematics
  - Unit 9: Measurement
  - Introduction to Volume and Surface Area of Cones and Pyramids

Group Members:

Dave Rumbolt, Jennifer Humby,

Mike O'Reilly, and Paul Hare

REVIEW

Unit Conversion

Unit	km	hm	dam	m	dm	cm	mm	μm
Number of Metres	1000	100	10	1	0.1	0.01	0.001	0.0001

inch	1
cm	2.54

Significant Digits

What are Significant Digits?

Multiplying and Dividing

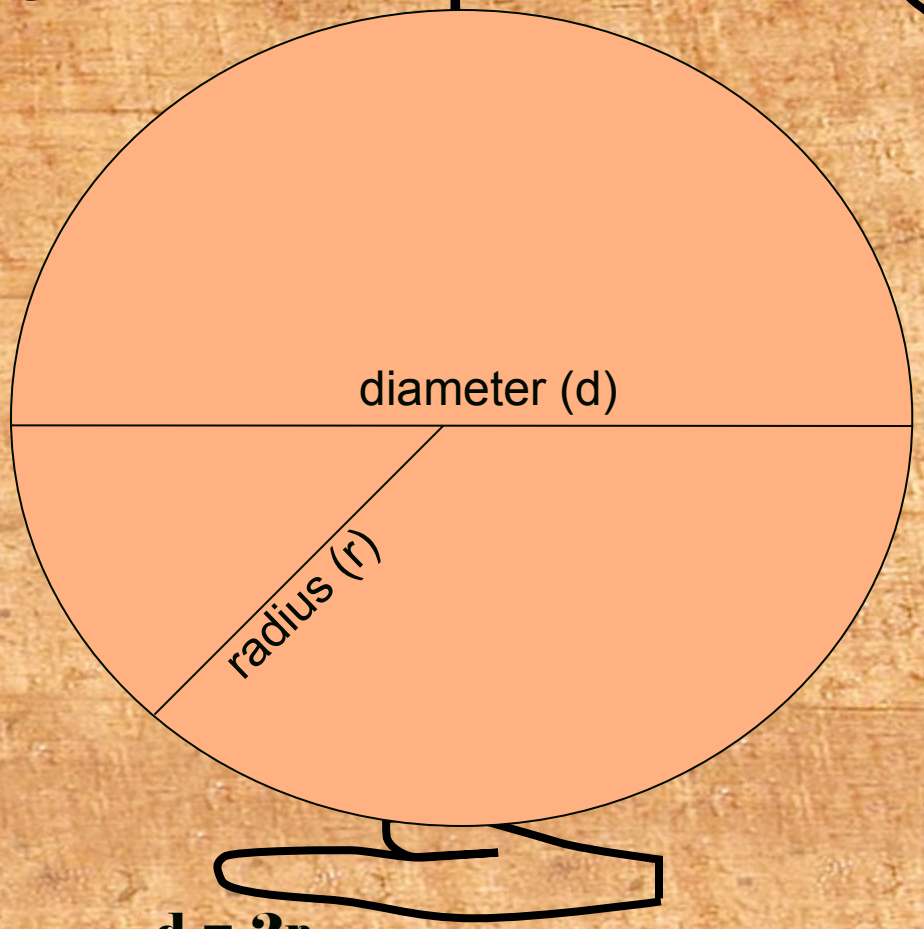
Number of significant digits in an answer should equal to the least number of significant digits in any one of the numbers being multiplied, divided etc

Addition and Subtraction

The number of *decimal places* (not significant digits) in the answer should be the same as the least number of decimal places in any of the numbers being added or subtracted

REVIEW

Properties of a Circle

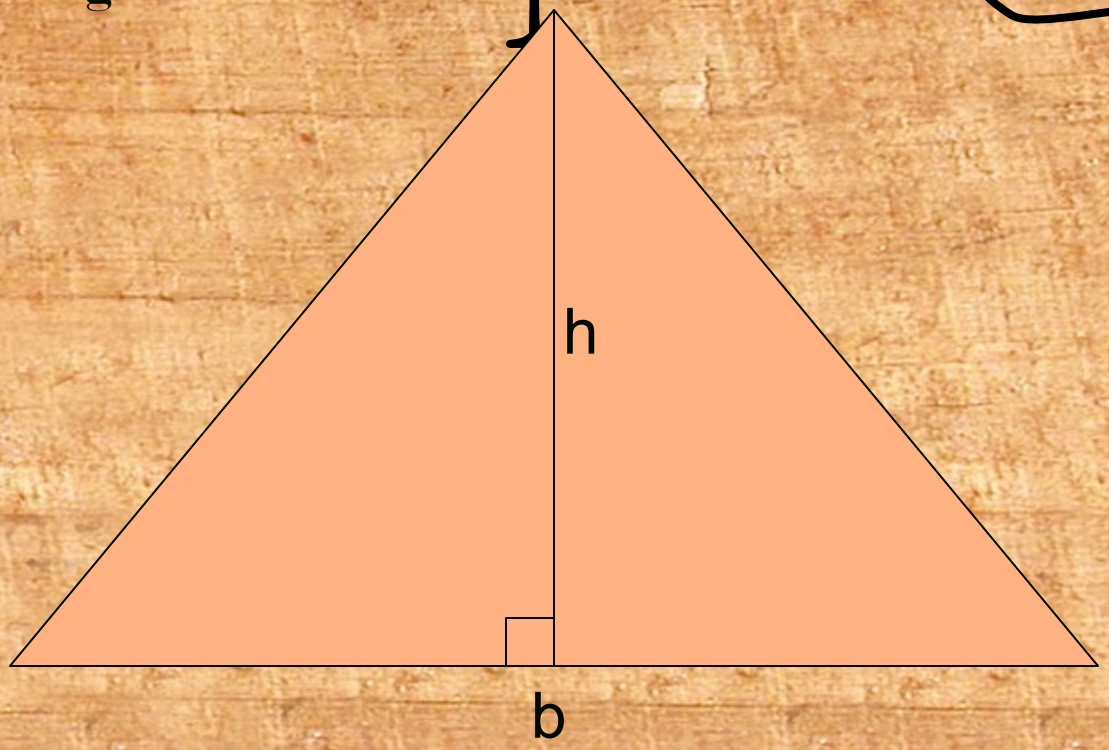


d = 2r

Area of a Circle = πr^2 units^2

REVIEW

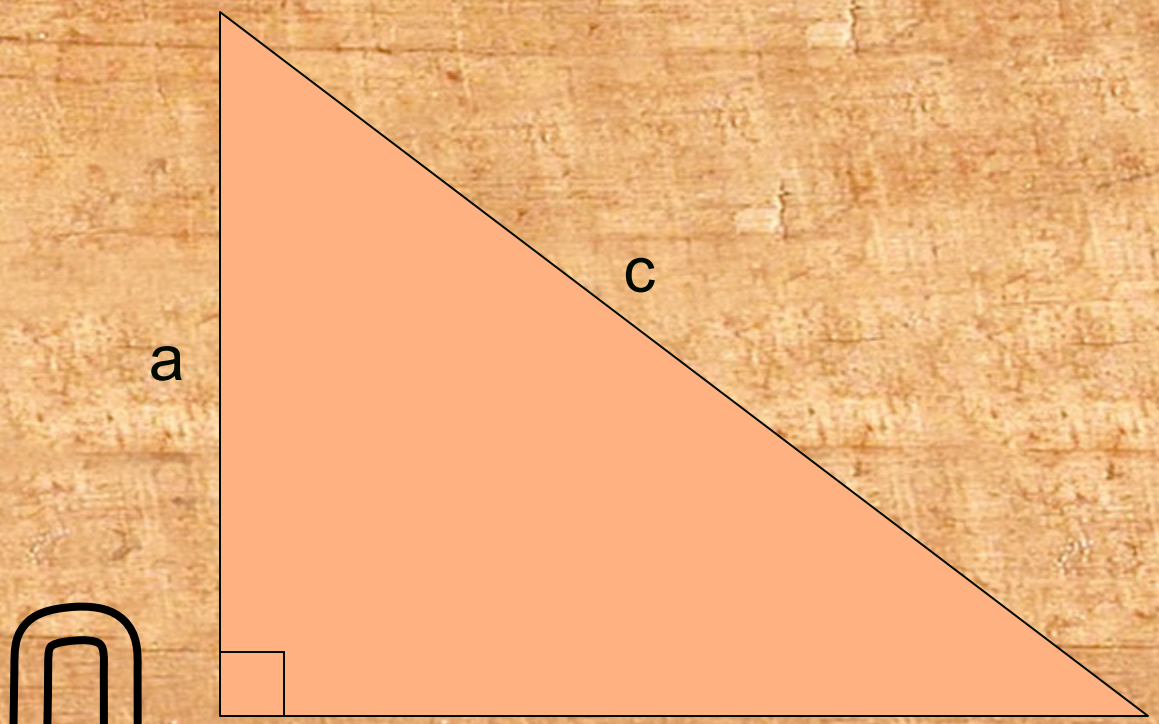
Area of a Triangle



$$\text{Area of a Triangle} = \frac{bh}{2} \text{ units}^2$$

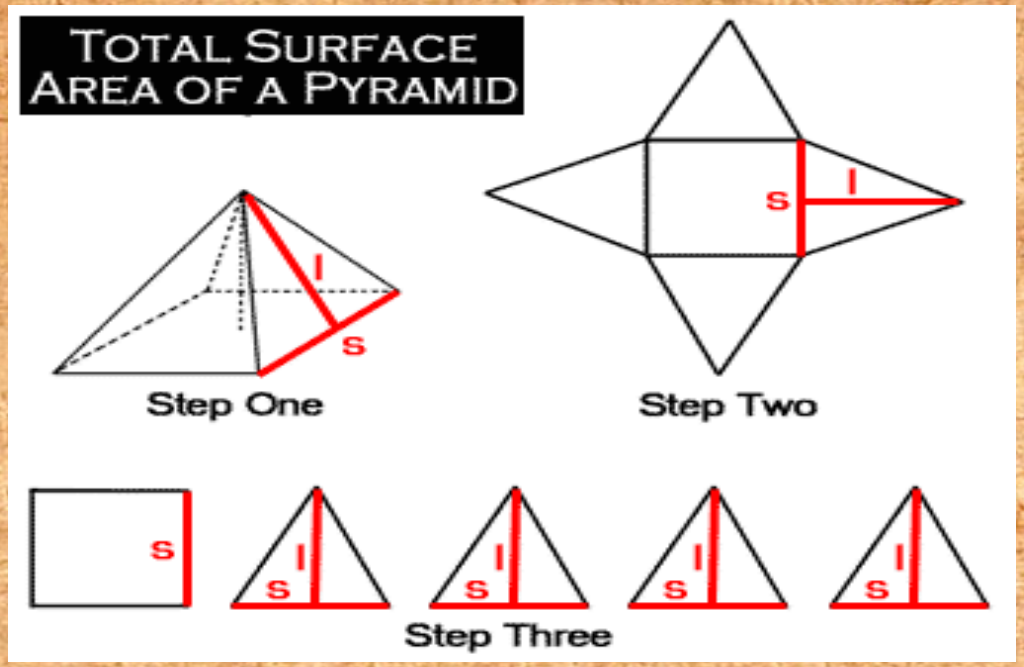
REVIEW

Pythagorean Theorem



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

Surface Area of a Pyramid

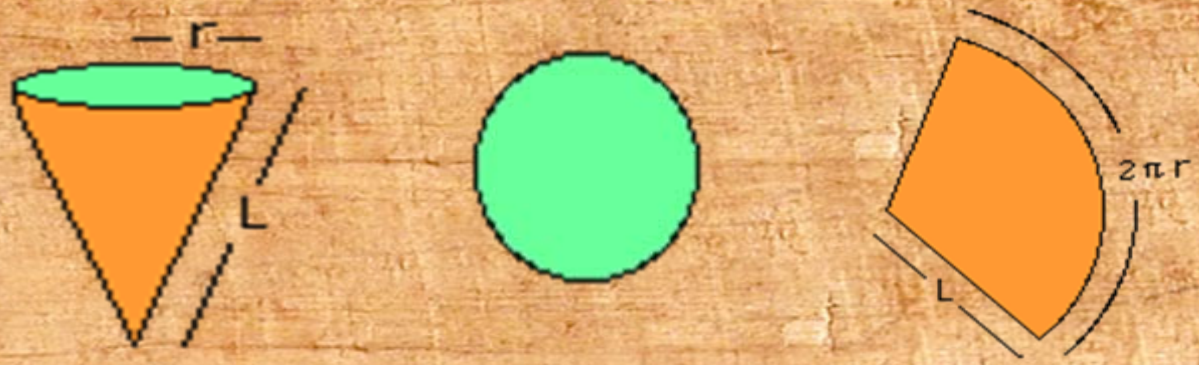


$$SA = s^2 + 2sl$$

Example

- The Louvre is a famous art gallery in Paris, France. It is housed in a historic palace and was opened in 1793. In 1989, it was expanded. One addition is a large glass square pyramid that covers the main entrance. Each wall of this pyramid is a triangle with base 35.4 m and height 27.9 m. Calculate the surface area of the glass in the pyramid.

Surface Area of a Cone



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

Example

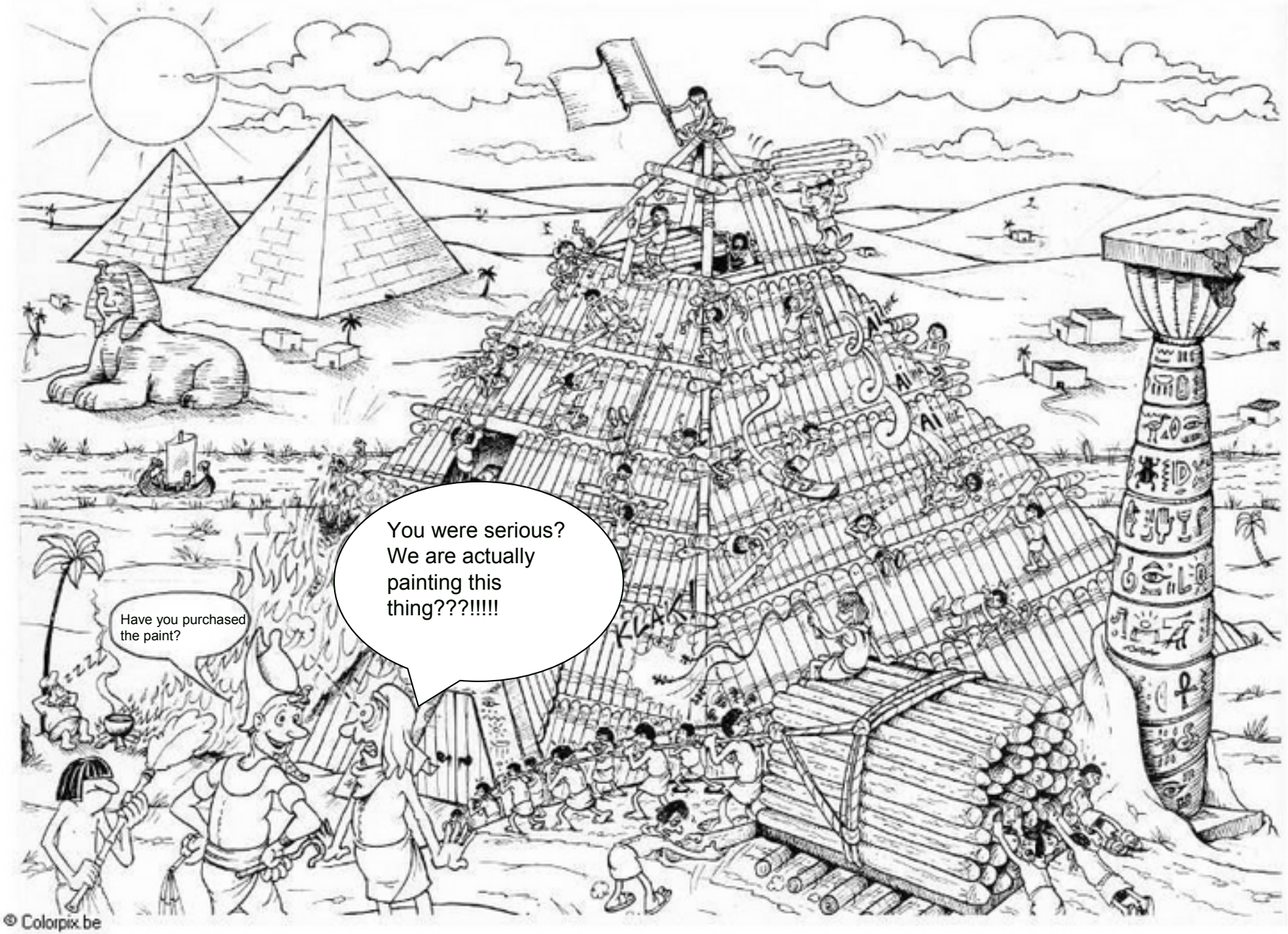
- Fireworks manufactures 6 different conical fireworks. One of these, the Golden Dragon, has a base radius of 3.3 cm and a slant of 15.0 cm. What area of paper is needed to cover the curved surface of this firework?

Investigation

- Exploring the Volume of Cones and Pyramids

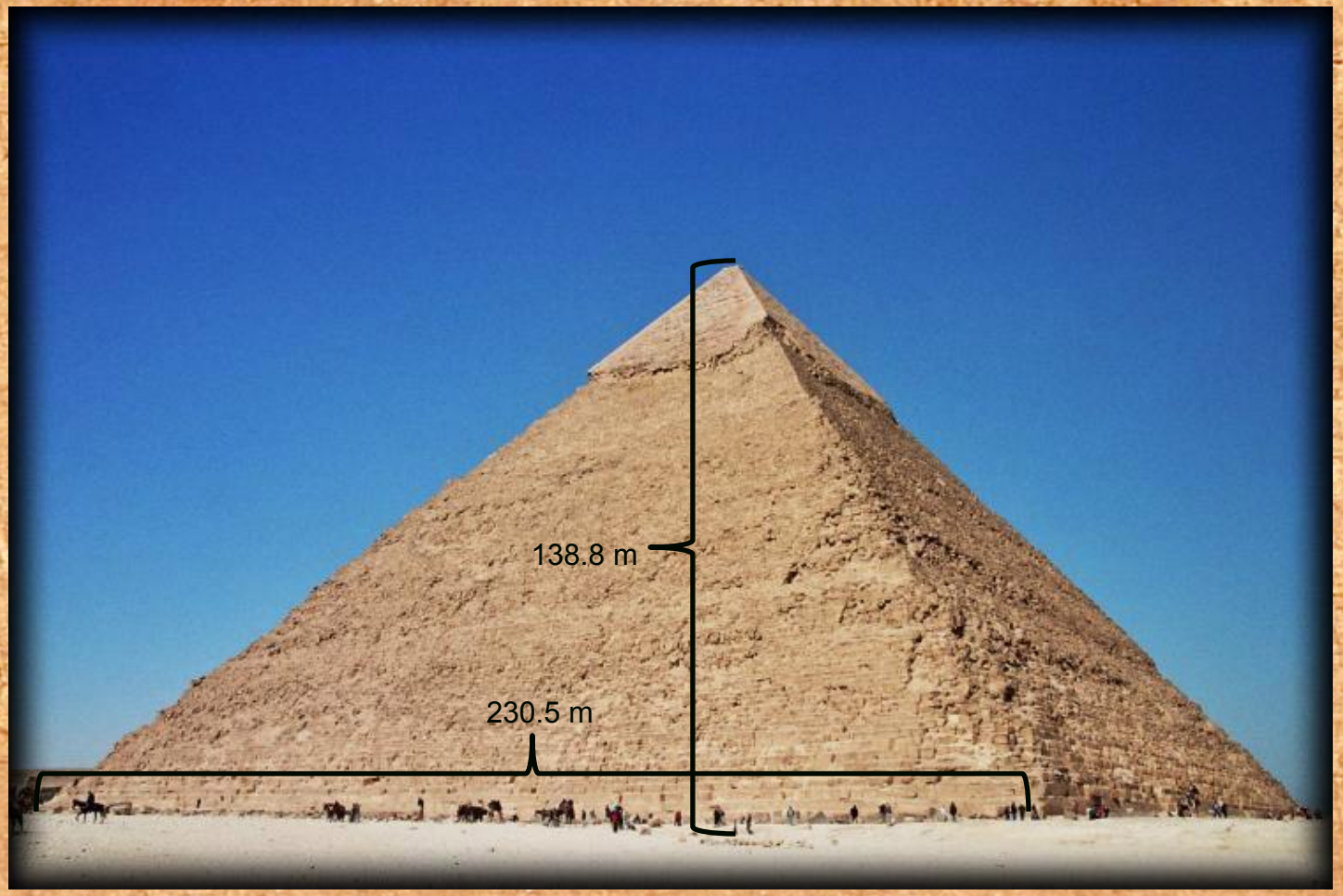
Rich Assessment Task

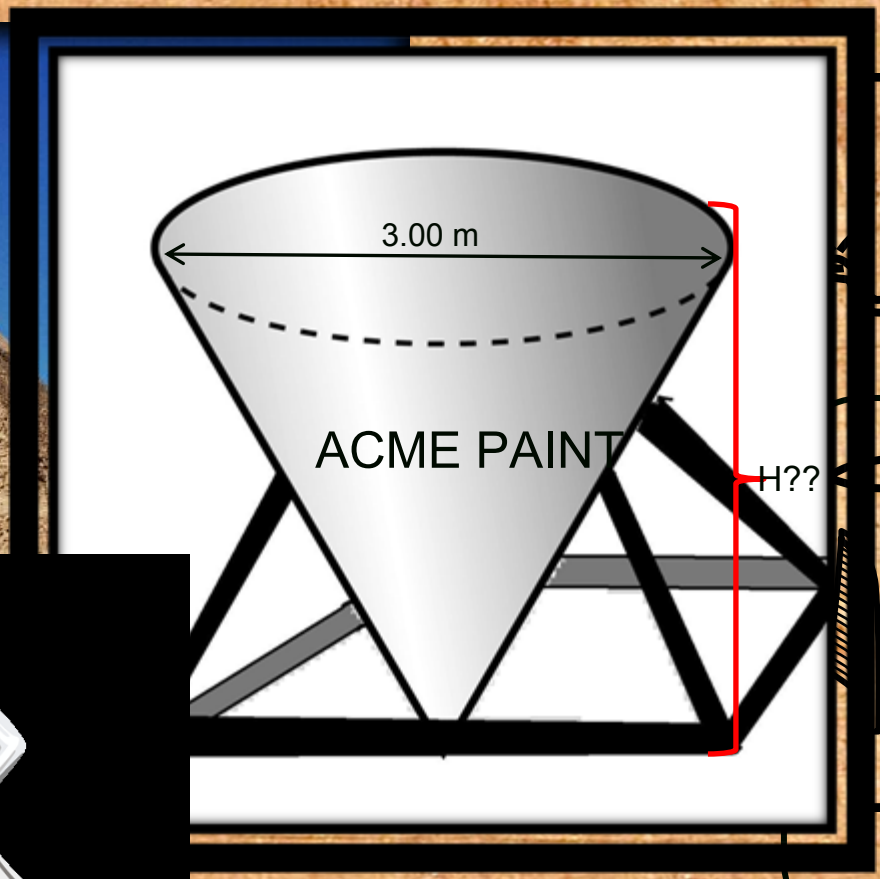
It's Time to Paint the Great Pyramid

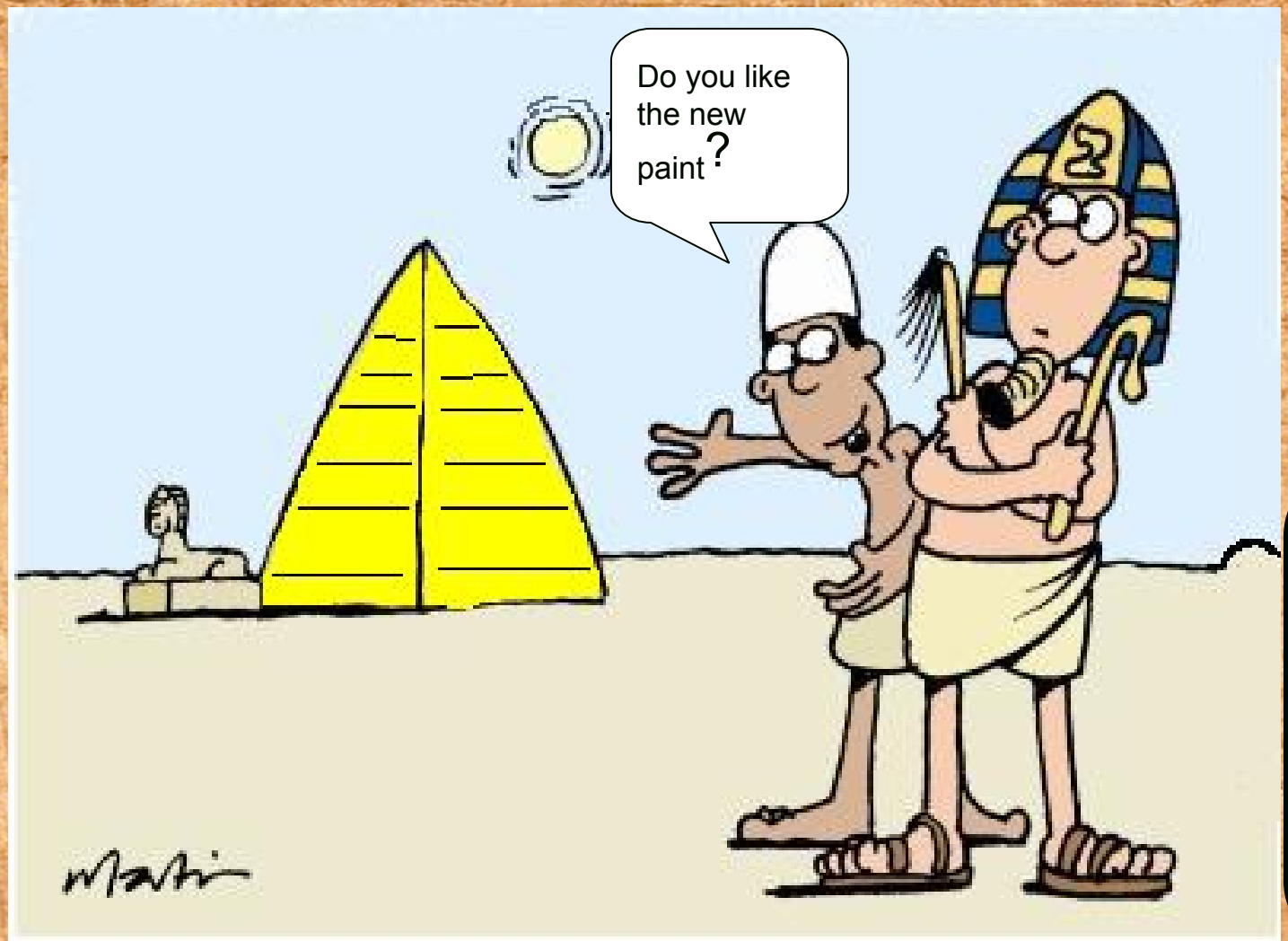

You were serious? We are actually painting this thing???!!!!!
Have you purchased the paint?
© Colorpix.be

Problem

King Ramses has ordered that the 4 sides of the Great Pyramid are to be painted. The paint comes in a conical container with a diameter of 3.00m. How high must the container be to hold the required amount of paint? The base of the pyramid is 230.5m and the top of the pyramid is 138.8m from the ground. One liter of paint covers $5m^2$ of Surface area.


138.8 m
230.5 m


3.00 m
ACME PAINT
H??



COMPLETED ON TIME AND ONLY 3,000 SLAVES OVER BUDGET!

Summary

- Cone
  - Surface Area = $\pi r^2 + 2rl$ units^2
  - Volume = $(\pi/3)r^2h$
- Square Pyramid
  - Surface Area = $b^2 + 2bs$ units^2
  - Volume = $b^2 \times h/3$