MATHEMATICAL SKILLS

VOLUME OF A SQUARE PYRAMID
AND
ASSOCIATED GEOMETRICAL SHAPES

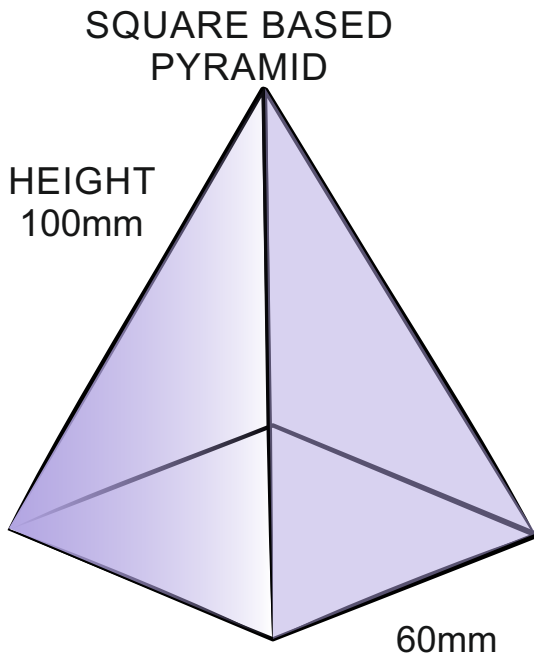## DESIGN AND TECHNOLOGY

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HOW TO CALCULATE THE VOLUME OF A REGULAR SQUARE PYRAMID

DEFINITION: A Regular Square Pyramid has a square base with triangular sides. The apex (highest point), is inline with the centre of the square base. A square pyramid is a relatively common geometrical shape/form.

SQUARE BASED
PYRAMID

HEIGHT
100mm

60mm

FORMULA

$$\text{Volume} = \frac{1}{3} \times \text{Base} \times \text{Height}$$

$$V = \frac{1}{3} \times B \times H$$

CALCULATE THE AREA OF BASE FIRST

AREA OF BASE = LENGTH²

AREA OF BASE = 60mm X 60mm = 3600mm²

THEN APPLY THE FOLLOWING FORMULA

$$\text{Volume} = \frac{1}{3} \times \text{Base} \times \text{Height}$$

$$V = \frac{1}{3} \times 3600\text{mm} \times 100\text{mm}$$

$$V = \frac{1}{3} \times 360000\text{mm}$$

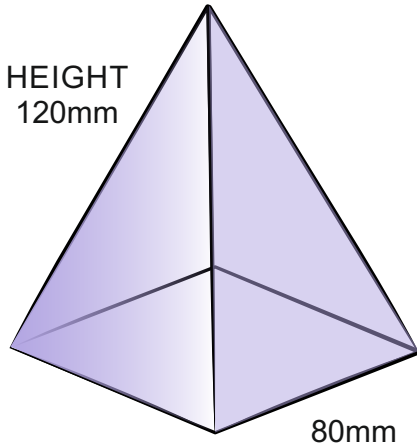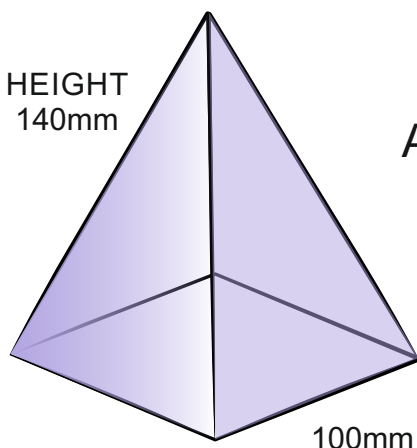$$V = \frac{360000\text{mm}}{3} = 120000\text{mm}^3$$

EXAMINATION QUESTIONS - SQUARE PYRAMIDS

FORMULA

Volume = $\frac{1}{3}$ x Base x Height

$V = \frac{1}{3}$ x B x H

Using the formula opposite, calculate the volumes of the following square pyramids.

HEIGHT
120mm

80mm

CALCULATE THE AREA OF BASE FIRST

AREA OF BASE = LENGTH²

AREA OF BASE = 80mm X 80mm = 6400mm²

THEN APPLY THE FOLLOWING FORMULA

Volume = $\frac{1}{3}$ x Base x Height

$V = \frac{1}{3}$ x 6400mm x 120mm

$V = \frac{1}{3}$ x 768000mm

$V = \frac{768000mm}{3} = 256000mm³$

HEIGHT
140mm

100mm

CALCULATE THE AREA OF BASE FIRST

AREA OF BASE = LENGTH²

AREA OF BASE = 100mm X 100mm = 10000mm²

THEN APPLY THE FOLLOWING FORMULA

Volume = $\frac{1}{3}$ x Base x Height

$V = \frac{1}{3}$ x 10000mm x 140mm

$V = \frac{1}{3}$ x 1400000mm

$V = \frac{1400000mm}{3} = 466666.66mm³$

EXAMINATION QUESTIONS - SQUARE PYRAMIDS

FORMULA

Volume = $\frac{1}{3}$ x Base x Height

V = $\frac{1}{3}$ x B x H

Using the formula opposite, calculate the volumes of the following square pyramids.

HEIGHT 120mm

80mm

CALCULATE THE AREA OF BASE FIRST

AREA OF BASE = LENGTH²

AREA OF BASE = _____

THEN APPLY THE FOLLOWING FORMULA

Volume = $\frac{1}{3}$ x Base x Height

_____

_____

_____

HEIGHT 140mm

100mm

CALCULATE THE AREA OF BASE FIRST

AREA OF BASE = LENGTH²

AREA OF BASE = _____

THEN APPLY THE FOLLOWING FORMULA

Volume = $\frac{1}{3}$ x Base x Height

_____

_____

_____