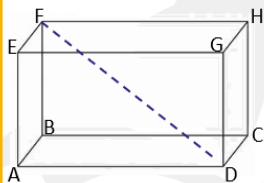


SUBJECT: Maths – Y10HAutumn

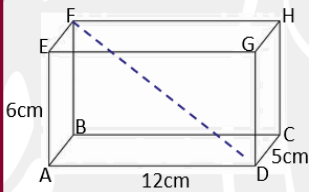
UNIT: Pythagoras

Key Concepts



The **plane** of a cuboid is a flat 2 dimensional surface.
An example of a plane is ABCD.

An example of a **diagonal** in a cuboid is FD.



Calculate the angle between FD and the plane ABCD:

$\tan \theta = \frac{6}{13}$
 $\theta = \tan^{-1}\left(\frac{6}{13}\right)$
 $\theta = 24.78^\circ$

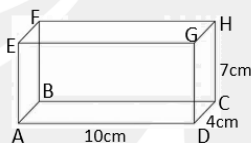
Examples

Calculate the length BD:

$BD^2 = 12^2 + 5^2$
 $BD = \sqrt{169}$
 $BD = 13\text{cm}$

Calculate the length FD:

$FD^2 = 13^2 + 6^2$
 $FD = \sqrt{205}$
 $FD = 14.32\text{cm}$



- 1) Calculate the length AC
- 2) Calculate the length AH
- 3) Calculate the angle between AH and the plane ABCD.

Key Words

3D Sine Cosine Tangent
Plane Diagonal

ANSWERS 1) 10.77cm 2) 12.84cm 3) 33.02°

SUBJECT: Maths

UNIT: Transformations

Key Concepts

A **reflection** creates a mirror image of a shape on a coordinate graph. The mirror line is given by an equation eg. $y = 2$, $x = 2$, $y = x$. The shape does not change in size.

A **rotation** turns a shape on a coordinate grid from a given point. The shape does not change size but does change orientation.

A **translation** moves a shape on a coordinate grid. Vectors are used to instruct the movement:

$\begin{pmatrix} x \\ y \end{pmatrix}$ → Positive-Right
Negative - Left
Positive-Up
Negative - Down

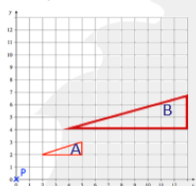
An **enlargement** changes the size of an image using a scale factor from a given point.

A **positive scale factor** will increase the size of an image.

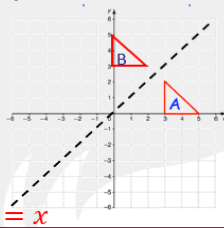
A **fractional scale factor** will reduce the size of an image.

A **negative scale factor** will place the image on the opposite side of the centre of enlargement, with the image inverted.

Enlarge shape A by scale factor 2 from point P.



Reflect shape A in the line $y = x$. Label it B.

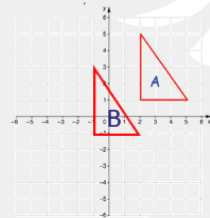


Examples

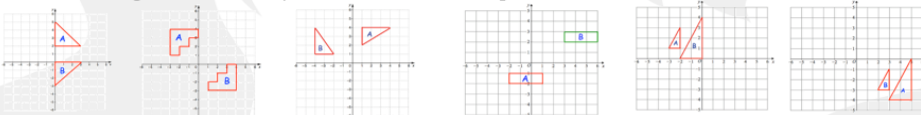
Rotate shape B from the point $(-1, -2)$



Translate shape A by $\begin{pmatrix} -3 \\ 2 \end{pmatrix}$. Label it B.



Describe the **single** transformation you see on each coordinate grid from A to B:



ANSWERS: a) reflection, $y = 1$ b) reflection $y = x$ c) rotation, centre $(0,0)$, 90° anticlockwise d) translation $\begin{pmatrix} 3 \\ 5 \end{pmatrix}$ e) enlarge, centre $\frac{1}{2}$ (-4,2) scale factor 2 f) enlarge, centre $(1,-2)$ scale factor $\frac{1}{2}$

Key Words

Rotate Clockwise Anticlockwise
Centre Degrees Reflect Translate Vector Scale Factor