

1st July



Corbettmaths

The first 4 terms of a sequence are:

204, 199, 192, 183

-5 -7 -9
-2 -2

Which term is the first to be negative?

$$t_n = an^2 + bn + c$$

$$2a = -2 \Rightarrow a = -1$$

$$3a + b = -5 \Rightarrow b = -2$$

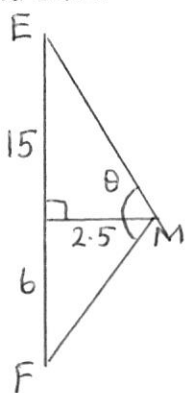
$$a + b + c = 204 \Rightarrow c = 207$$

$$t_n = -n^2 - 2n + 207$$

$$t_{13} = 12, \quad \underline{t_{14} = -17}$$

ABCDE and ABCDF are square based pyramids with $AB = 5\text{cm}$.
The vertex E is directly above the centre of ABCD and the vertex F is directly below the centre of ABCD.

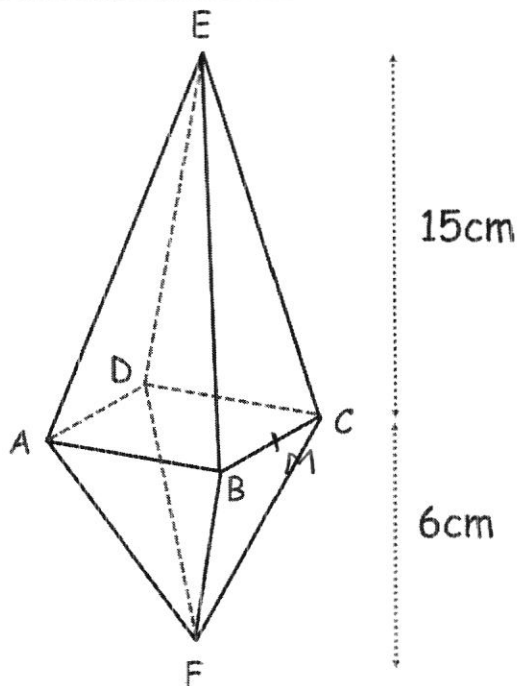
Calculate the angle between planes BCF and BCE.



$$\theta = \tan^{-1}\left(\frac{15}{2.5}\right) + \tan^{-1}\left(\frac{6}{2.5}\right)$$

$$= \underline{147.9^\circ}$$

$$(32.1^\circ)$$



Solve

$$25^{0.25y} \times 5 = 125^{1-3y}$$

$$(5^2)^{0.25y} \times 5 = (5^3)^{1-3y}$$

$$5^{1+0.5y} = 5^{3-9y}$$

$$1 + 0.5y = 3 - 9y$$

$$9.5y = 2$$

$$\underline{y = \frac{4}{19}}$$

Solve $3\sin\theta = \cos\theta$ for $0^\circ \leq \theta \leq 360^\circ$

$$\tan\theta = \frac{1}{3}$$

$$\underline{\theta = 18.4^\circ, 198.4^\circ}$$