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## National 5 Maths 3D Coordinates

SQA past paper and specimen paper  
questions and answers by topic

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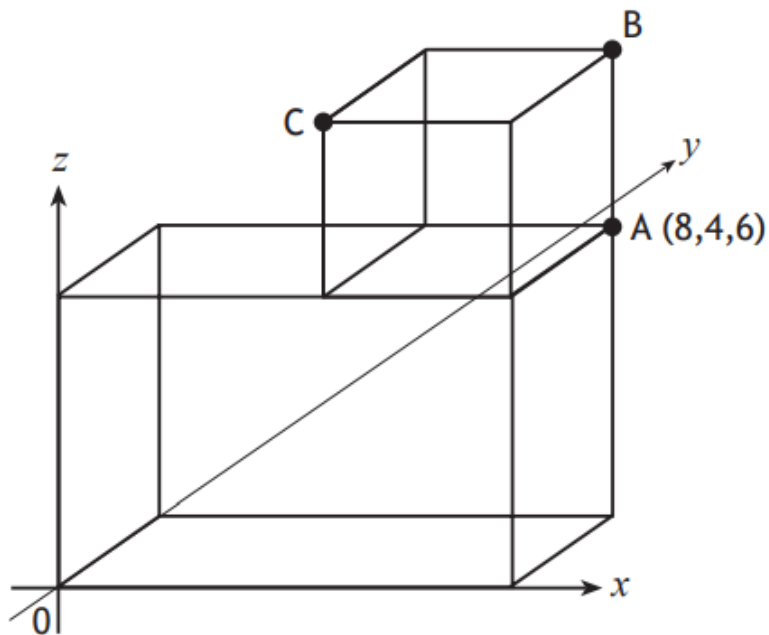
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National 5 Maths  
SQA 2014 Paper 2  
Question 2

The diagram shows a cube placed on top of a cuboid, relative to the coordinate axes.



A is the point  $(8, 4, 6)$ .

Write down the coordinates of B and C.

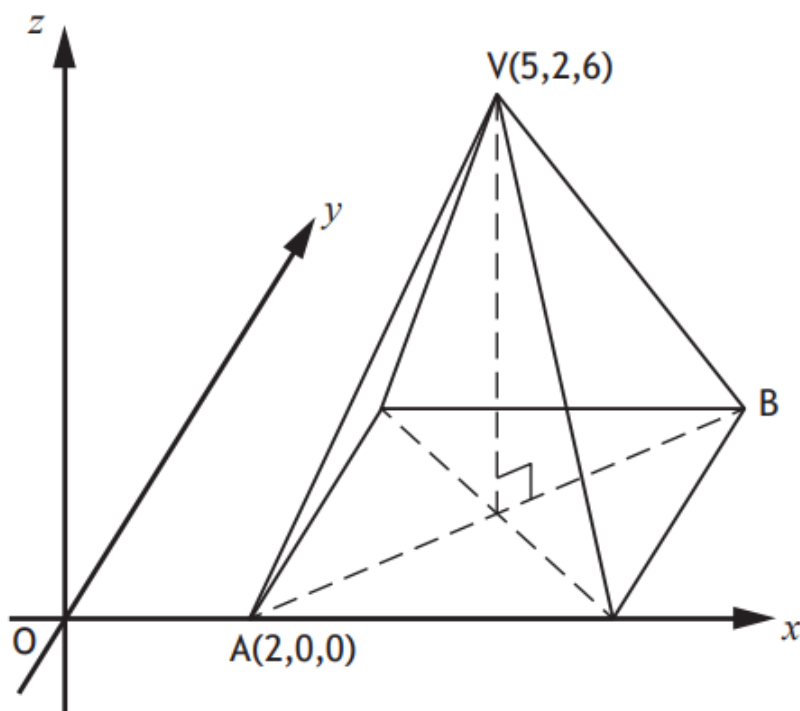
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Answer:

B  $(8, 4, 10)$

C  $(4, 0, 10)$

The diagram shows a rectangular based pyramid, relative to the coordinate axes.



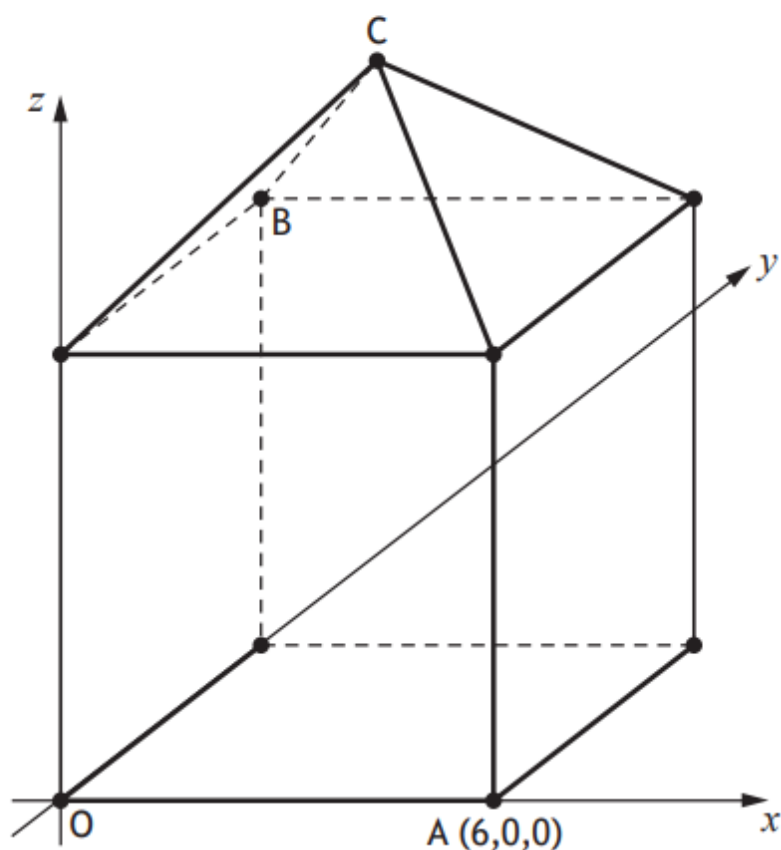
- A is the point  $(2,0,0)$ .
- V is the point  $(5,2,6)$ .

- (a) Write down the coordinates of B. 1
- (b) Calculate the length of edge AV of the pyramid. 3

Answers:

- (a)  $B(8, 4, 0)$
- (b) 7

The diagram shows a square-based pyramid placed on top of a cube, relative to the coordinate axes.



The height of the pyramid is half of the height of the cube.

A is the point  $(6,0,0)$ .

The point C is directly above the centre of the base.

Write down the coordinates of B and C.

2

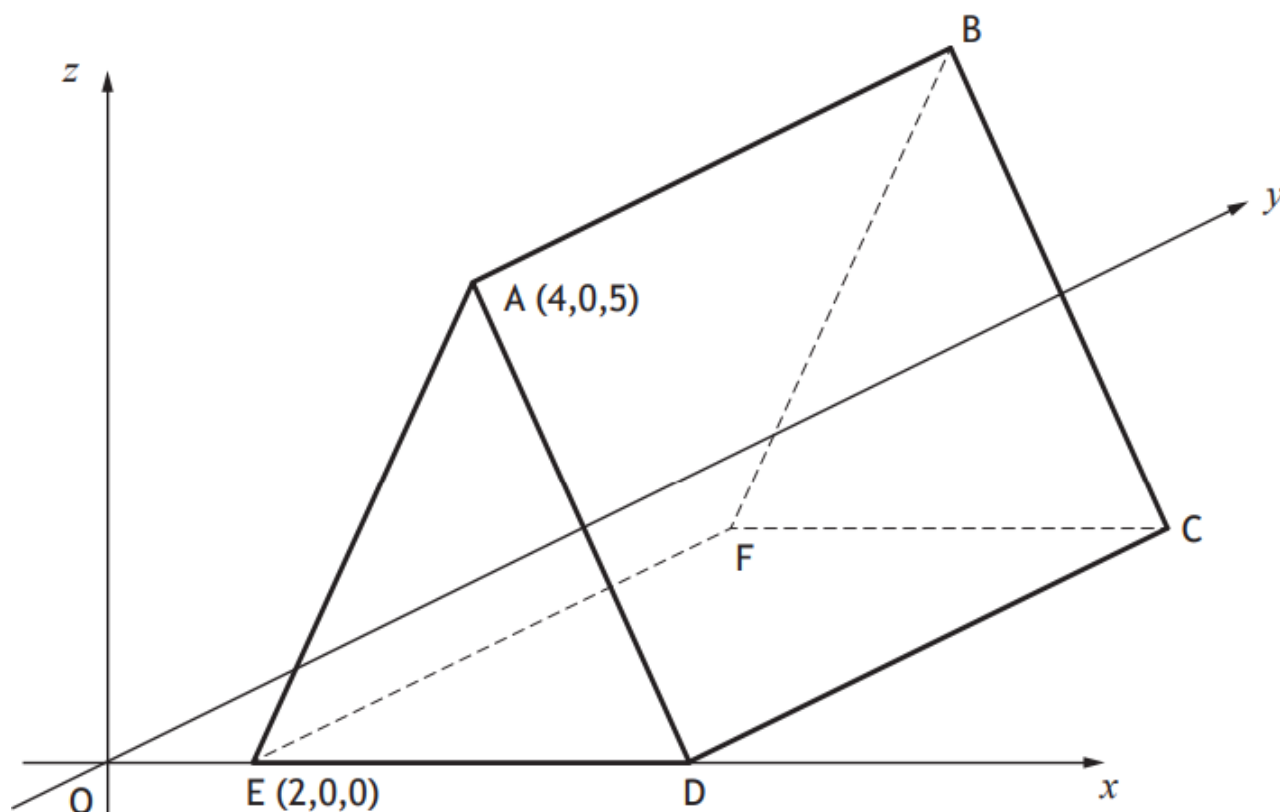
Answer:

B  $(0, 6, 6)$

C  $(3, 3, 9)$



The diagram shows a triangular prism,  $ABCDEF$ , relative to the coordinate axes.



- $AD = AE$ .
- $DC = 8$  units.
- Edges  $EF$ ,  $DC$  and  $AB$  are parallel to the  $y$ -axis.

Write down the coordinates of  $B$  and  $C$ .

2

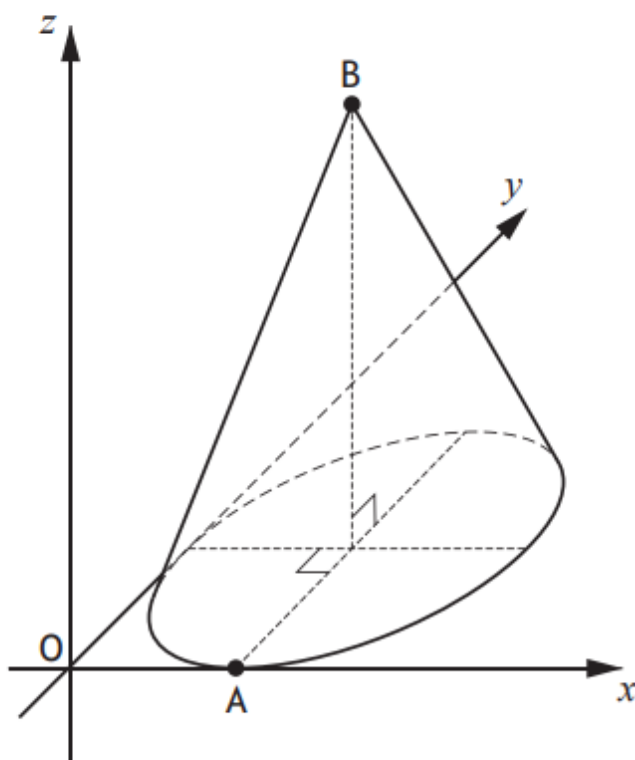
Answer:

$B(4, 8, 5)$

$C(6, 8, 0)$



The diagram shows a cone with diameter 6 units and height 8 units.



- The  $x$ -axis and the  $y$ -axis are tangents to the base
- A is the point of contact between the base and the  $x$ -axis
- B is directly above the centre of the base

Write down the coordinates of A and B.

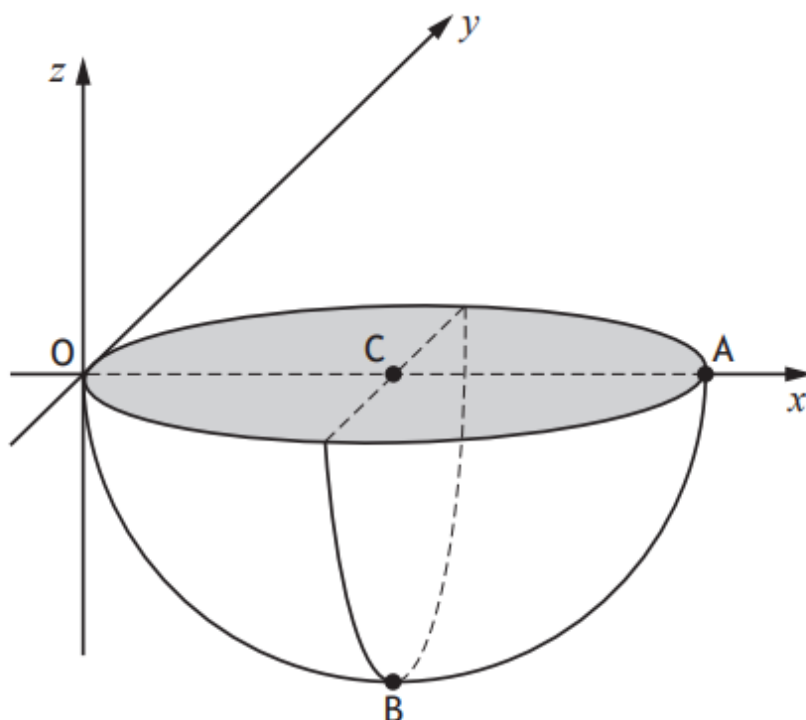
2

Answer:

A (3, 0, 0)

B (3, 3, 8)

The diagram shows a hemisphere relative to the coordinate axes.



- A is the point  $(6, 0, 0)$
- C is the midpoint of diameter OA
- B is vertically below C

(a) State the coordinates of B. 1

(b) Calculate the volume of the hemisphere.

Give your answer in its simplest form in terms of  $\pi$ . 2

Answers:

(a)  $(3, 0, -3)$

(b)  $18\pi$