10

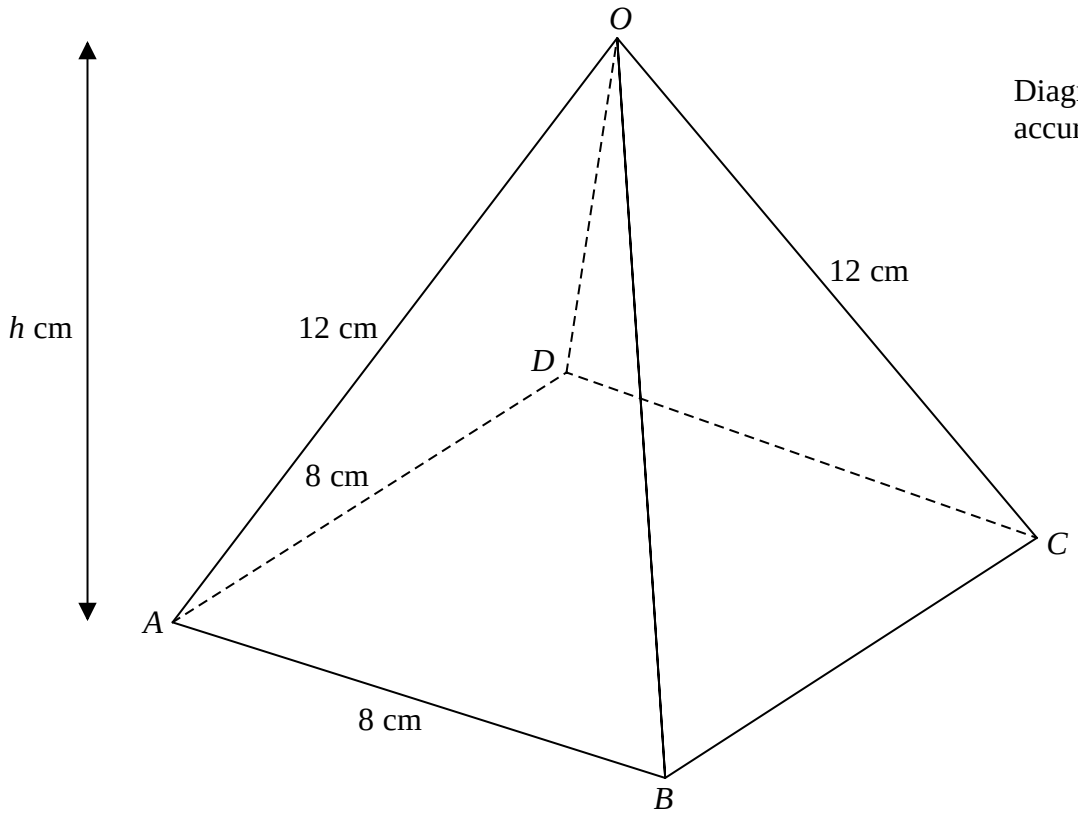

Diagram **NOT** accurately drawn

Figure 2

Figure 2 shows a right pyramid *ABCDO* with a horizontal square base of side 8 cm. The vertical height of the pyramid is *h* cm and $OA = OB = OC = OD = 12$ cm.

(a) Find the exact value of *h*.

(3)

(b) Find, to 1 decimal place, the size of the angle between *OA* and the plane *ABCD*.

(2)

(c) Find, to 1 decimal place, the size of the angle between the plane *AOB* and the plane *ABCD*.

(2)

The midpoint of *OA* is *P* and *Q* is the point on *BC* such that $BQ : QC = 3 : 1$

(d) Show that $PQ = 4\sqrt{5}$ cm.

(4)

(e) Find, to 1 decimal place, the size of angle *PQA*.

(4)

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.....

.....

Question 10 continued

Question 10 continued

Question 10 continued

(Total for Question 10 = 15 marks)

11

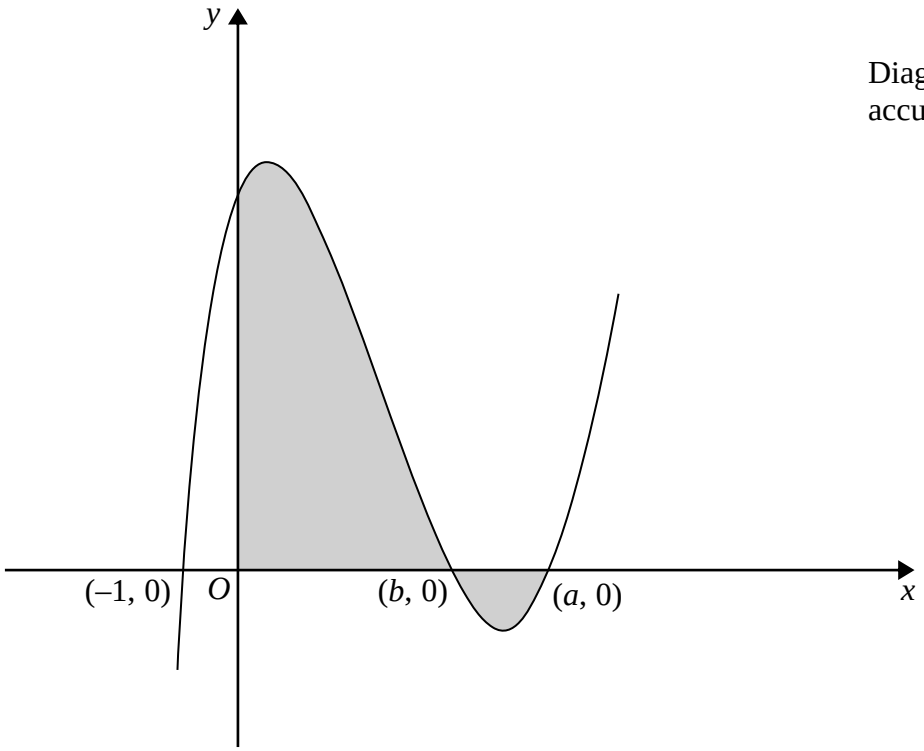

Diagram **NOT** accurately drawn

Figure 3

Figure 3 shows a sketch of the curve with equation $y = f(x)$, which passes through the points with coordinates $(-1, 0)$, $(b, 0)$ and $(a, 0)$ where $0 < b < a$.

Given that $f'(x) = 6x^2 - 26x + 12$

(a) find,

(i) the value of a,

(ii) the value of b.

(8)

(b) Use algebraic integration to determine the exact value of the total area of the shaded regions shown in Figure 3.

(5)

Question 11 continued

Question 11 continued

Question 11 continued

(Total for Question 11 is 13 marks)

TOTAL FOR PAPER IS 100 MARKS

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