Pegasys Publishing

Int2
M1

Intermediate 2: *Mathematics 1*

Extended Unit Test 2006/7

1. At beginning of 2004 Calum bought a painting worth £2500. Over the next two years it increased in value at the rate of 15% per annum.

Unfortunately at the beginning of 2006 there was a fire at Calum's flat and the painting lost 32% of its value due to smoke damage.

Was the painting worth more or less after the fire than it was when it was bought?

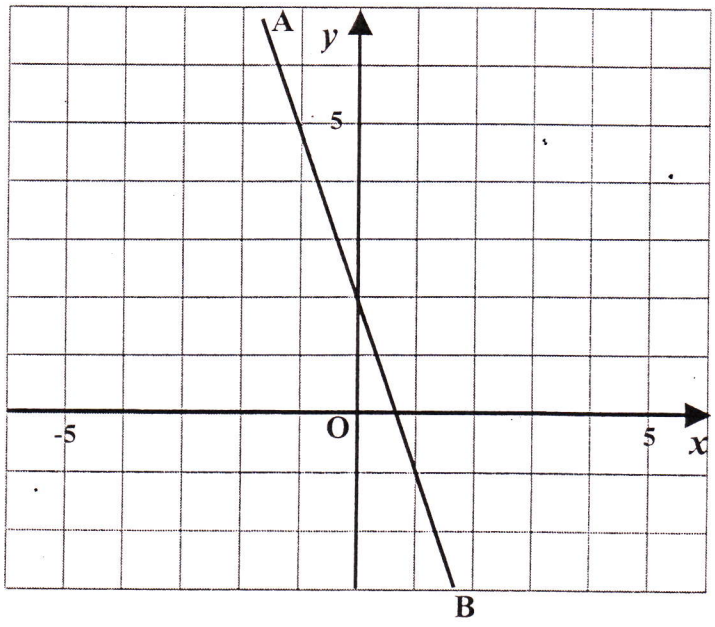
You must show all working. [4]

2. Factorise fully

(a) $x^2 + 4x - 21$ [2]

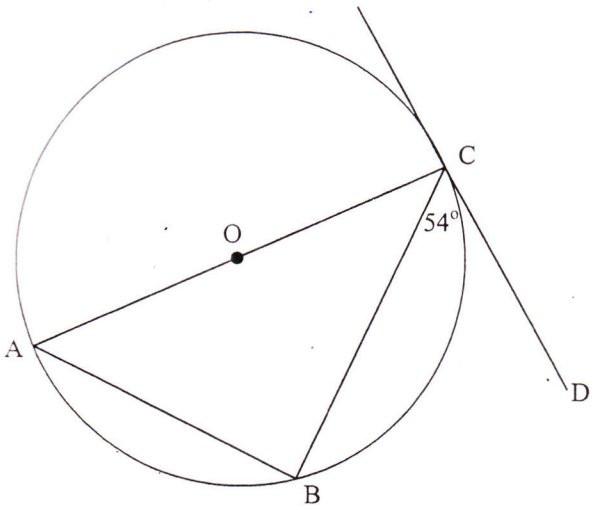
(b) $3c^2 - 7c - 6$ [2]

3. Find the equation of the line, AB, shown in the diagram.



[3]

4.

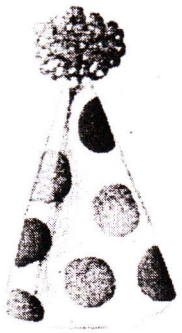


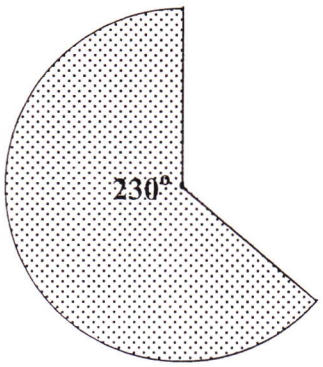
AC is a diameter and O is the centre of the circle shown opposite. CD is a tangent to the circle with C the point of contact.

If $\angle BCD = 54°$,
find the size of $\angle CAB$.

[4]

5. This clown's hat is made from a sector of a circle with diameter 48cm.





If the angle at the centre of the sector is 230°, calculate the area of card needed make the hat.

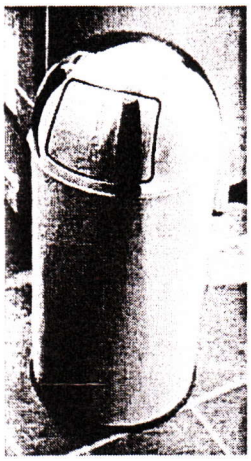
[3]

6. Remove the brackets and tidy up terms

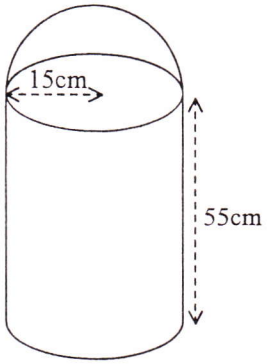
(a) $6(4x - 5) + 3(2x + 3)$ **[3]**

(b) $2x(x^2 - 5x) - 4(x^2 - 2)$ **[4]**

7. A waste bin is in the shape of a cylinder with a hemisphere on top. The radius of the bin is 15cm and the height of the cylindrical part is 55cm.



Given that $1cm^3$ is equivalent to 1ml and that there are 1000ml in 1 litre, find the capacity of the bin. [Answer to the nearest litre]

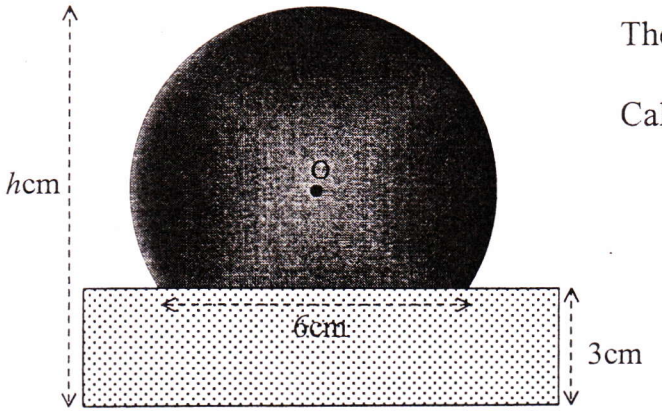


Volume of cylinder = $\pi r^2 h$

Volume of sphere = $\frac{4}{3}\pi r^3$

[6]

8. A bowling trophy consists of a glass circle set into a rectangular wooden plinth as shown in the diagram. The diameter of the circle, centre O, is 8cm and the height of the plinth is 3 cm.



The width of the glass at the plinth is 6cm.

Calculate the height, h cm, of the trophy.

[5]

9. The number of hits to a website in the month of January was 234 000 and in February increased to 378 500.

Calculate, correct to 3 significant figures, the percentage increase in hits from January to February.

[4]

END OF QUESTION PAPER