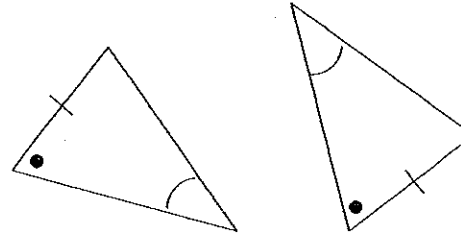


Question 1 (5 marks)

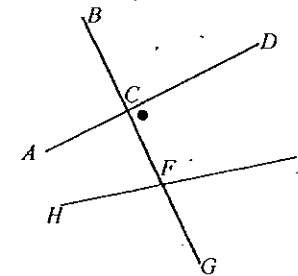
Answers

1) Given that $f(x) = x^3 + 4x - 7$, evaluate $f(1)$

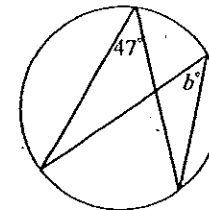
2) For what reason are the two triangles below congruent?



1) The angle $\angle DCF$ is marked on the right. WRITE down an angle alternate to it. (AD and HE are NOT parallel lines.)



1) Write down the value of b .

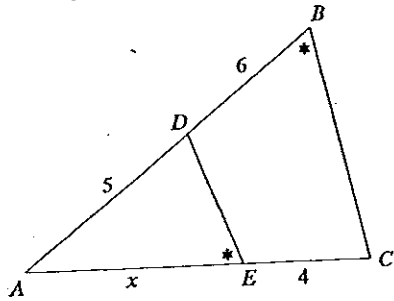


NOT TO SCALE

1) Write a monic polynomial of degree 4 with a constant term of -5 .

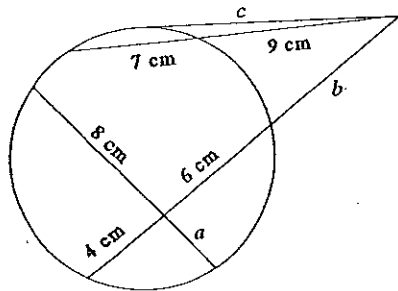
Question 6 (15 marks)

18) (a) Name the pair of similar triangles and prove that they are similar.



(b) Find the value of x .

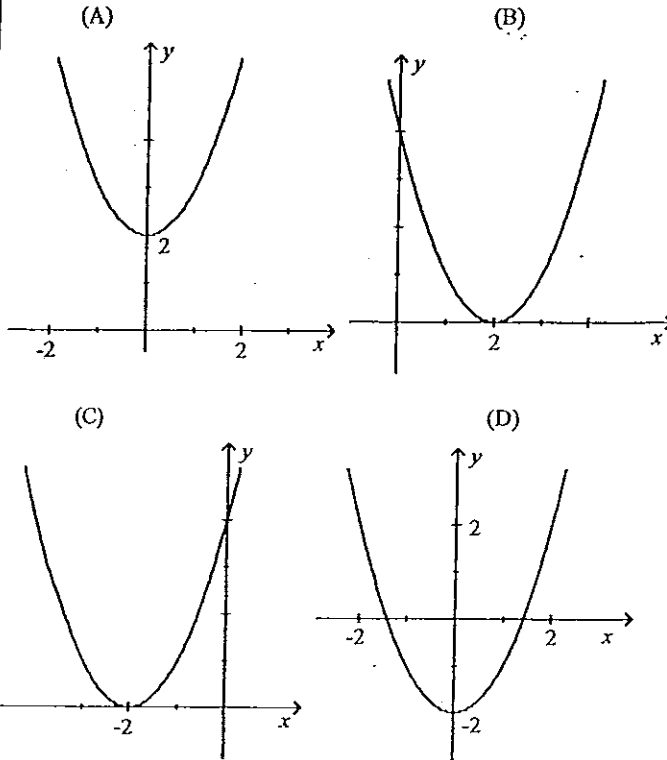
19) Find the values of the pronumerals (note that reasons are not necessary, but working MUST be shown to get ANY marks).



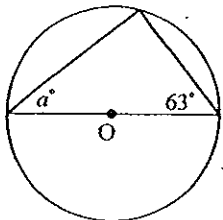
Question 2 (6 marks)

Answers

6) Which of the following graphs represents $y = (x+2)^2$



7) O is the centre of the circle.



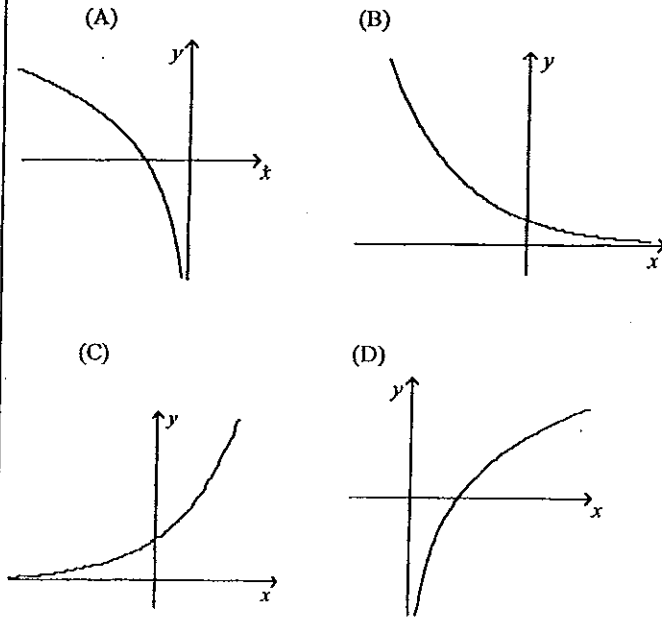
$a = ?$ (Give reasoning)

NOT TO SCALE

Question 2 continued

Answers

8) The graph of $y = 2^x$ could be:



9) Consider the function $f(x) = \frac{5}{\sqrt{3-x}} + 4$.
 What values would have to be excluded from the domain?
 Indicate your solution on a number line.

Question 3 (11 marks)

Answers

10) For $P(x) = 4x^3 - 13x + 6$, use the Remainder Theorem to find the remainder when $P(x)$ is divided by $x + 2$.

What can you conclude about $x + 2$ and $P(x)$?

11) $p(x) = x - 1$
 $q(x) = x^3 + 3x - 4$

Evaluate the following

(a) $p(x) + q(x)$

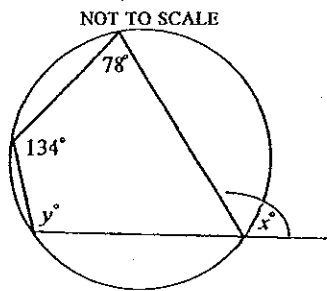
(b) $p(x) \cdot q(x)$

(c) $q(x) \div p(x)$

12) Evaluate the pronumerals, giving reasons.

(a) $x = ?$

(b) $y = ?$

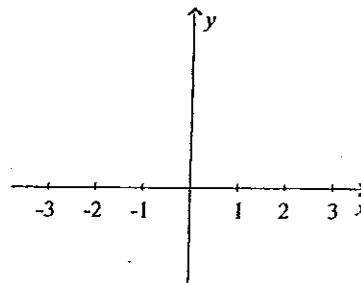


Question 4 (6 marks)

Answers

13) Graph the polynomial on the number plane provided below, clearly showing the intercepts.

$$y = 3x(1 - x)(x + 3)$$



4) For $f(x) = \frac{3x+1}{2}$ and $g(x) = \frac{2x-1}{3}$ consider the following statements:

I. $f(g(2)) = 2$

II. $g(x) = f^{-1}(x)$

(A) Both are true

(B) I is true only

(C) II is true only

(D) Neither are true.

(Marks may be awarded for relevant working)

Question 5 (14 marks)

- 15) Construct a right angle triangle with one angle of 15° , using only compasses and a straight edge.
 Note that all construction lines must be visible.

- 16) Fill in the blanks in the following proof.

Aim: to prove that the line from the centre of a circle to the midpoint of a chord is perpendicular to the chord.

Proof: _____ = _____ (Data),

_____ is common,

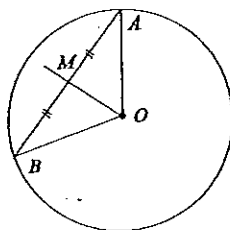
$OA = OB$ (_____),

$\therefore \triangle OAM \cong \triangle OBM$ (_____).

Hence $\angle OMA = \angle OMB$ (_____),

But $\angle OMA + \angle OMB = 180^\circ$ (_____),

$\therefore \angle OMA = \angle OMB = 90^\circ$.



Question 5 continued

- 1) (a) Make a neat sketch of $y = x^3$.
 (b) Hence neatly sketch the graph of $y = 1 - (x+1)^3$.

