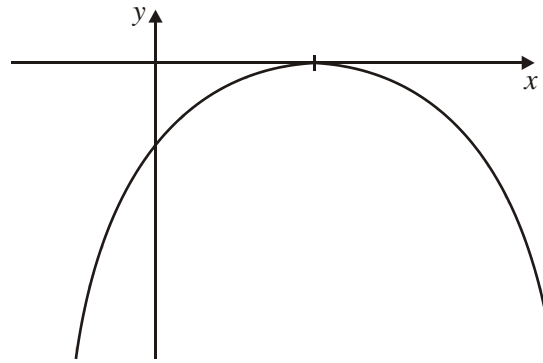


1. The diagram shows the graph of the function $y = ax^2 + bx + c$.



Complete the table below to show whether each expression is positive, negative or zero.

Expression	positive	negative	zero
a			
c			
$b^2 - 4ac$			
b			

(Total 4 marks)

2. Find the largest domain for the function $f: x \mapsto \frac{1}{\sqrt{4 - 9x^2}}$.

Working:

Answers:

.....

(Total 4 marks)

3. Two functions f, g are defined as follows:

$$f : x \rightarrow 3x + 5$$
$$g : x \rightarrow 2(1 - x)$$

Find

- (a) $f^{-1}(2)$;
- (b) $(g \circ f)(-4)$.

<i>Working:</i>	<i>Answers:</i> (a)
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(Total 4 marks)

4. Find the possible values of k where the following quadratic equation has equal roots.

$$x^2 - kx + (k + 1) = 0$$

<i>Working:</i>	<i>Answers:</i>
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(Total 4 marks)

5. Given $f(x) = x^2 + x(2 - k) + k^2$, find the range of values of k for which $f(x) > 0$ for all real values of x .

Working:

Answers:
.....

(Total 4 marks)

6. Let $f(x) = \sqrt{x}$, and $g(x) = 2^x$. Solve the equation

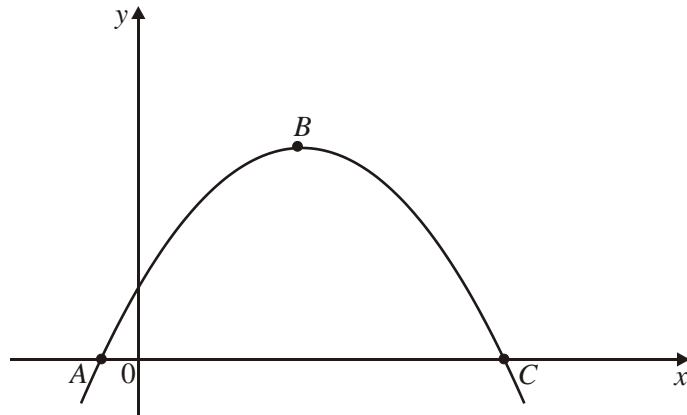
$$(f^{-1} \circ g)(x) = 0.25.$$

Working:

Answers:
.....

(Total 4 marks)

7. The diagram shows the parabola $y = (7 - x)(1 + x)$. The points A and C are the x -intercepts and the point B is the maximum point.



Find the coordinates of A , B and C and rewrite the equation in vertex form

Working:

Answers:

.....

.....

.....

(Total 4 marks)

8. Given $f(x) = x^2 + x(2 - k) + k^2$, find the range of values of k for which $f(x) > 0$ for all real values of x .

Working:

Answers:

.....

(Total 4 marks)