

## Topic Test 1 (20 minutes)

Further quadratics, rearranging formulae and identities - Higher)

1 
$$f(x) = 2x + 3$$
 and  $g(x) = x^2$ 

**1 (a)** Circle the expression that represents  $f^{-1}(x)$ 

[1 mark]

$$2(x - 3)$$

$$\frac{x+3}{2}$$
  $\frac{x-3}{2}$ 

$$\frac{x-3}{2}$$

$$3x + 2$$

Circle the expression that represents fg(x)

[1 mark]

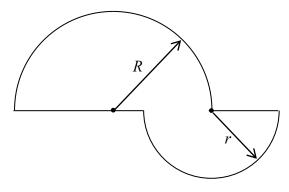
$$(2x + 3)^2$$
  $2x^2 + 3$ 

$$2x^2 + 3$$

$$(2x)^2 + 3$$

$$2x + 3^2$$

2 A shape is made from a large semicircle, radius R, and a small semicircle, radius r, joined as shown.



Work out an expression for the perimeter of the shape.

[2 marks]

Answer

3	Simplify	$(3x^2y)^3$
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[2 marks]

Answer

4 Expand 
$$(x-5)(2x+1)(3x+2)$$

[3 marks]

Answer

5 Which one of the following has been wrongly written as an identity? Circle your answer

[1 mark]

$$(x + a)(x - a) \equiv x^2 - a^2$$
  $(w + a)^2 \equiv w^2 + 2aw + a^2$ 

$$(w + a)^2 \equiv w^2 + 2aw + a^2$$

$$(p-a)^2 \equiv p^2 - 2ap - a^2$$

$$y(y+a) \equiv y^2 + ay$$

6	Factorise fully $18a^2 - 32$	[2 marks
	Answer	
7	Factorise $12x^2 - 5x - 3$	[2 marks
	Answer	
3	Rearrange $y = \frac{2x - 1}{4x + 5}$ to make $x$ the subject.	[3 marks

9 The algebraic fraction 
$$\frac{ax^2 + bx + c}{dx^2 - 4}$$
 will simplify to  $\frac{2x + 3}{3x + 2}$ 

Work out the values of a, b, c and d.

[3 marks]