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]

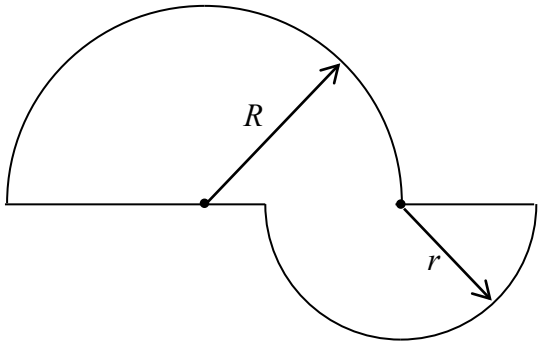
$2(x - 3)$ $\quad \frac{x+3}{2}$ $\quad \frac{x-3}{2}$ $\quad 3x + 2$

1 (b) Circle the expression that represents $fg(x)$

[1 mark]

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

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 $\left(3x^2y\right)^3$

[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]

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

$(p - a)^2 \equiv p^2 - 2ap - a^2$ $\quad$ $y(y + a) \equiv y^2 + ay$

6 Factorise fully $18a^2 - 32$

[2 marks]

Answer _____

7 Factorise $12x^2 - 5x - 3$

[2 marks]

Answer _____

8 Rearrange $y = \frac{2x - 1}{4x + 5}$ to make x the subject.

[3 marks]

Answer _____

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]

a = _____

b = _____

c = _____

d = _____