1 $G = c^2 - 4c$

(b) Find the value of G when $c = -5$

$G =$ .....

(2)

(Total for Question 1 is 2 marks)

2 The function f is such that $f(x) = (x - 4)^2$ for all values of x.

(a) Find f(1)

.....

(1)

(b) State the range of the function f.

.....

(1)

The function g is such that $g(x) = \dfrac{4}{x + 3}$ $x \neq -3$

(c) Work out fg(2)

.....

(2)

(Total for Question 2 is 4 marks)

3 A is inversely proportional to the square of r

$A = 5$ when $r = 0.3$

(a) Find a formula for A in terms of r

.....

(3)

(b) Find the value of A when $r = 7.5A$

$A =$ .....

(3)

(Total for Question 3 is 6 marks)

4 $w = 5y^2 - y^3$

(a) Work out the value of w when $y = -2$

$w =$ .....

(2)

(Total for Question 4 is 2 marks)

5 The function f is defined as

$$f: x \mapsto \frac{2x}{x-6} \qquad x \neq 6$$

(a) Find f(10)

.....

(1)

(Total for Question 5 is 1 marks)

6 A particle P moves along a straight line.
The fixed point O lies on this line.

The displacement of P from O at time t seconds, $t \geqslant 1$, is s metres where

$$s = 4t^2 + \frac{125}{t}$$

The velocity of P at time t seconds, $t \geqslant 1$, is v m/s

Work out the distance of P from O at the instant when $v = 0$

..... m

(Total for Question 6 is 5 marks)

7 M varies directly as the cube of h
$M = 4$ when $h = 0.5$

Find the value of h when $M = 500$

.....

(Total for Question 7 is 4 marks)

8 $a = \dfrac{14}{3x - 7}$ $x = \dfrac{7}{4y - 3}$

Express a in the form $\dfrac{py + q}{ry + s}$ where p, q, r and s are integers.

Give your answer in its simplest form.

$a =$ .....

(Total for Question 8 is 3 marks)

9 y is inversely proportional to $\sqrt{x}$
x is directly proportional to T^3

Given that $y = 8$ when $T = 25$

find the exact value of T when $y = 27$

$T =$ .....

(Total for Question 9 is 4 marks)

10 A is inversely proportional to C^2

$A = 40$ when $C = 1.5$

Calculate the value of C when $A = 1000$

$C =$ .....

(Total for Question 10 is 3 marks)

11 The function f is such that

$$f(x) = \frac{2}{3x - 5} \qquad \text{where } x \neq \frac{5}{3}$$

(a) Find $f\left(\frac{1}{3}\right)$

.....

(1)

(Total for Question 11 is 1 marks)

12 P is inversely proportional to y^2
When $y = 4$, $P = a$

(a) Find a formula for P in terms of y and a

.....

(3)

Given also that y is directly proportional to $\sqrt{x}$
and when $x = a$, $P = 4a$

(b) find a formula for P in terms of x and a

.....

(3)

(Total for Question 12 is 6 marks)

13 (b) Work out the value of F when $r = 48$

.....

(1)

(Total for Question 13 is 1 marks)

14 $P = m^2 - 4c$

(a) Work out the value of P when $m = -5$ and $c = 3$

$P =$ .....

(2)

(Total for Question 14 is 2 marks)