

(1) Two functions are given as
 $f(x) = 3x$ and $g(x) = 5x^2$

Find:

- (a) $f(2)$ (b) $g(1)$
(c) $g(-2)$ (d) $f(-10)$

(2) $f(x) = 4 - 10x$

Given that $f(p) = 64$, find
the value of p .

(3) $g(x) = \frac{1}{x}$ and $h(x) = x^3$

- (a) Find the value of $g\left(\frac{1}{2}\right)$
(b) Given that $h(p) = 8$, find
the value of p .

(4) Two functions are given as
 $m(x) = 1 - x$ and $n(x) = x^2$

- (a) Find the value of $mn(2)$
(b) Find the value of $nm(-3)$
(c) Show that:

$$nm(x) \equiv 1 - 2x + x^2$$

(d) Show that $nm(1 - \sqrt{3})$ is
an integer.

(5) $p(x) = x$ and $q(x) = \sqrt{x}$

- (a) Find $q(12)$ in its simplest
form.
(b) Show that $qp(64)$ is a
cube number.
(c) Find $q^2(81)$
(d) Write down the value of
 $p^n(1)$.

(6) $f(x) = x^{\frac{4}{3}}$. Find $f(-8)$

(7) $g(x) = 10 - 3x$ and
 $h(x) = 2x - 4$. Find the

value of x such that:

$$g(x) = h(x)$$

(8) $m(x) = 1 - x^3$ and

$$n(x) = \frac{2}{x}$$

- (a) Find $n^2(4)$
(b) Find $mn(4)$
(c) Given that $m(k) = -26$
find the value of k .
(d) Given that $n(p) = \frac{1}{8}$, find
the value of p .

(9) Two functions are:

$$f(x) = 2x^2 \text{ and } g(x) = 3 - x$$

Show that:

$$fg(x) = 18 - 12x + 2x^2$$

(10) $f(x) = \sqrt{x}$ & $g(x) = x^{\frac{1}{3}}$

- (a) Show that $ff(64)$ is a
surd.
(b) Show that $gf(64)$ is an
integer.
(c) Given that $g(p) = \frac{2}{5}$, find p
(d) If $f(x) = x + 1$ show that:

$$x^2 + x + 1 = 0$$

(11) $r(x) = x\sqrt{x}$

Show that:

$$r(3) - 2(\cos 30 + \tan 60) = 0$$

(12) $f(x) = tx - 4$ where t is
a constant.

Show that:

$$[f(x)]^2 = t^2x^2 - 8tx + c$$

stating the value of c .

(13) $f(x) = \frac{1}{x^2}$

Find the negative solution to
the equation $f(x) = 4$

(14) $m(x) = x^{-\frac{2}{3}}$

Solve the equation:

$$m(x) = 125$$

(15) $g(x) = 1 + \sqrt{x}$

- (a) Find $g^{-1}(x)$
(b) Find the value of $g^{-1}(6)$
(c) Solve $g^{-1}(x) = -2x$