**1.** Rearrange $a(q - c) = d$ to make $q$ the subject.

$aq - ac = d$

$aq = d + ac$

$q = \frac{d + ac}{a}$

$q =$ $\frac{d + ac}{a}$

**(3)**

**(Total 5 marks)**

**2.** (a) Make $n$ the subject of the formula $m = 5n - 21$

$m + 21 = 5n$

$n = \frac{m + 21}{5}$

$n =$ $\frac{m + 21}{5}$

**(2)**

(b) Make $p$ the subject of the formula $4(p - 2q) = 3p + 2$

$4p - 8q = 3p + 2$

$p - 8q = 2$

$p = 2 + 8q$

$p =$ $2 + 8q$

**(3)**

**(Total 5 marks)**

**3.** $P = \pi r + 2r + 2a$

Make $r$ the subject of the formula

$P = \pi r + 2r + 2a$

$P - 2a = \pi r + 2r$

$P - 2a = r(\pi + 2)$

$r = \frac{P - 2a}{\pi + 2}$

$r =$ $\frac{P - 2a}{\pi + 2}$

**(Total 3 marks)**

**4.** Make $a$ the subject of the formula

$$2(3a - c) = 5c + 1$$

$$6a - 2c = 5c + 1$$

$$6a = 7c + 1$$

$$a = \frac{7c+1}{6}$$

$a = \frac{7c+1}{6}$

**(Total 3 marks)**

**5.** Make $m$ the subject of the formula $2(2p + m) = 3 - 5m$

$$4p + 2m = 3 - 5m$$

$$4p + 7m = 3$$

$$7m = 3 - 4p$$

$$m = \frac{3-4p}{7}$$

$m = \frac{3-4p}{7}$

**(Total 3 marks)**

**6.** Make $x$ the subject of

$$5(x-3) = y(4-3x)$$

$$5x - 15 = 4y - 3xy$$

$$5x - 15 + 3xy = 4y$$

$$5x + 3xy = 4y + 15$$

$$x(5 + 3y) = 4y + 15$$

$$x = \frac{4y + 15}{5 + 3y}$$

$x =$ $\frac{4y+15}{5+3y}$

**(Total 4 marks)**

**7.** When you are $h$ feet above sea level, you can see $d$ miles to the horizon, where

$$d = \sqrt{\frac{3h}{2}}$$

Make $h$ the subject of the formula

$$d^2 = \frac{3h}{2}$$

$$2d^2 = 3h$$

$$h = \frac{2d^2}{3}$$

$h =$ $\frac{2d^2}{3}$

**(Total 4 marks)**

**8.** $y = \dfrac{2pt}{p-t}$

Rearrange the formula to make $t$ the subject.

$$y = \frac{2pt}{p-t}$$

$$y(p-t) = 2pt$$

$$py - ty = 2pt$$

$$py = 2pt + ty$$

$$py = t(2p+y)$$

$$t = \frac{py}{2p+y}$$

$t =$ $\dfrac{py}{2p+y}$

**(Total 4 marks)**

**9.** Make $b$ the subject of the formula $a = \dfrac{2-7b}{b-5}$

$$a(b-5) = 2-7b$$

$$ab - 5a = 2 - 7b$$

$$ab - 5a + 7b = 2$$

$$ab + 7b = 2 + 5a$$

$$b(a+7) = 2 + 5a$$

$$b = \frac{2+5a}{a+7}$$

$b =$ $\dfrac{2+5a}{a+7}$

**(Total 4 marks)**

**10.** $P = \dfrac{n^2 + a}{n + a}$

Rearrange the formula to make $a$ the subject.

$P(n+a) = n^2 + a$

$Pn + Pa = n^2 + a$

$Pa = n^2 - Pn + a$

$Pa - a = n^2 - Pn$

$a(P-1) = n^2 - Pn$

$a = \dfrac{n^2 - Pn}{P-1}$

$a =$ $\dfrac{n^2 - Pn}{P-1}$

**(Total 4 marks)**

**11.** $\dfrac{x}{x+c} = \dfrac{p}{q}$

Make $x$ the subject of the formula.

$xq = p(x+c)$

$xq = px + cp$

$xq - px = cp$

$x(q-p) = cp$

$x = \dfrac{cp}{q-p}$

$x =$ $\dfrac{cp}{q-p}$

**(Total 4 marks)**

**12.** Rearrange $\frac{1}{u}+\frac{1}{v}=\frac{1}{f}$

to make $u$ the subject of the formula.

Give your answer in its simplest form.

$$\frac{1}{u}+\frac{1}{v}=\frac{1}{f}$$

$$\frac{v}{uv}+\frac{u}{uv}=\frac{1}{f}$$

$$\frac{v+u}{uv}=\frac{1}{f}$$

$$f(v+u)=uv$$

$$fv+fu=uv$$

$$fv=uv-fu$$

$$fv=u(v-f)$$

$$u=\frac{fv}{v-f}$$

$u = \frac{fv}{v-f}$

.....

**(Total 5 marks)**