

MODUL 4
SPM 'ENRICHMENT'.
TOPIC: QUADRATIC EXPRESSIONS AND EQUATIONS.
TIME : 2 HOURS

1. Solve the quadratic equation

(a) $\frac{3x(x-1)}{2} = x + 6$

(b) $(w - 1)^2 - 3^2 = 0$

(c) $2a^2 = 3(1 + a) + 2$

(d) $\frac{5p^2 + 3p}{1 + p} = 4$

$$(e) \frac{3t^2}{2} = 7t - 4$$

$$(f) x^2 - 2 = \frac{11x - 5}{4}$$

$$(g) \frac{m^2 - 6}{5} = m$$

$$(h) (2x + 1)(x - 2) = 7$$

$$(i) p + 2 = \frac{p + 2}{p - 3}$$

(j) $3x(2x - 1) + 8x = 1$

(k) $\frac{3y^2 - 2}{5} = y$

(l) $(r - 1)(r + 3) = 5(r + 3)$

(m) $7p - 2p^2 = 2(1 + p)$

(n) $5x = \frac{x^2 + 25}{2}$

$$(o) \frac{p^2 + 5}{6} = p$$

$$(p) 4(5x - 1) = \frac{-3(5x - 1)}{x}$$

$$(q) d = \frac{7 - 6d}{d}$$

$$(r) \frac{2m^2 + 5m}{m + 1} = 2$$

$$(s) \frac{3m(m - 1)}{m + 1} = 2$$

(t) $y^2 + 9y - 1 = 3(y - 2)$

MODULE 4 - ANSWERS
TOPIC: QUADRATIC EXPRESSIONS AND EQUATIONS.

Answer:

(a) $\frac{3x(x-1)}{2} = x + 6$
 $3x^2 - x - 12 = 0 \dots\dots\dots 1$
 $(3x+4)(x-3) = 0 \dots\dots\dots 1$
 $x = \frac{4}{3} \quad x = 3 \dots\dots\dots 1,1$

(b) $(w-1)^2 - 3^2 = 0$
 $w^2 - 2w - 8 = 0 \dots\dots\dots 1$
 $(w+2)(w-4) = 0 \dots\dots\dots 1$
 $w = 4 \quad w = -2 \dots\dots\dots 1,1$

(c) $2a^2 = 3(1+a) + 2$
 $2a^2 - 3a - 5 = 0 \dots\dots\dots 1$
 $(a+1)(2a-5) = 0 \dots\dots\dots 1$
 $a = -1 \quad x = \frac{5}{2} \dots\dots\dots 1,1$

(d) $\frac{5p^2 + 3p}{1+p} = 4$
 $5p^2 - p - 4 = 0 \dots\dots\dots 1$
 $(5p-4)(p+1) = 0 \dots\dots\dots 1$
 $p = \frac{4}{5} \quad p = -1 \dots\dots\dots 1,1$

(e) $\frac{3t^2}{2} = 7t - 4$
 $3t^2 + 14t - 8 = 0 \dots\dots\dots 1$
 $(3t-2)(t+4) = 0 \dots\dots\dots 1$

$$t = \frac{2}{3} \quad t = 4 \dots\dots\dots 1,1$$

$$(g) \quad x^2 - 2 = \frac{11x - 5}{4}$$

$$4x^2 - 11x - 5 = 0 \dots\dots\dots 1$$

$$(4x+1)(x - 3) = 0 \dots\dots\dots 1$$

$$x = \frac{1}{4} \quad x = 3$$

$$(g) \quad \frac{m^2 - 6}{5} = m$$

$$m^2 - 5m - 6 = 0 \dots\dots\dots 1$$

$$(m - 6)(m + 1) = 0 \dots\dots\dots 1$$

$$m = 6 \quad m = -1 \dots\dots\dots 1,1$$

$$(i) \quad (2x + 1)(x - 2) = 7$$

$$2x^2 - 3x - 9 = 0 \dots\dots\dots 1$$

$$(x+3)(x - 3) = 0 \dots\dots\dots 1$$

$$x = -3 \quad x = 3 \dots\dots\dots 1,1$$

$$(i) \quad p+2 = \frac{p+2}{p-3}$$

$$p^2 - 2p - 8 = 0 \dots\dots\dots 1$$

$$(p+2)(p-4) = 0 \dots\dots\dots 1$$

$$p = -2 \quad p = 4 \dots\dots\dots 1,1$$

$$(k) \quad 3x(2x - 1) + 8x = 1$$

$$6x^2 + 5x - 1 = 0 \dots\dots\dots 1$$

$$(x+1)(6x - 1) = 0 \dots\dots\dots 1$$

$$x = -1 \quad x = \frac{1}{6} \dots\dots\dots 1,1$$

(k) $\frac{3y^2-2}{5} = y$
 $3y^2 - 5y - 2 = 0$ 1
 $(y+1)(y-2)=0$ 1
 $y = -1 \quad y = 2$ 1,1

(o) $(r-1)(r+3) = 5(r+3)$
 $r^2 - 3r - 18 = 0$ 1
 $(r+6)(r-3)=0$ 1
 $y = -6 \quad y = 3$ 1,1

(p) $7p - 2p^2 = 2(1 + p)$
 $2p^2 - 5p + 2 = 0$ 1
 $(2p-1)(2p+5) = 0$ 1
 $p = \frac{1}{2} \quad p = \frac{-5}{2}$ 1,1

(q) $5x = \frac{x^2 + 25}{2}$
 $x^2 - 10x + 25 = 0$ 1
 $(x-5)(x-5)=0$ 1
 $x=5$ 1

(o) $\frac{p^2+5}{6} = p$
 $p^2 - 6p + 5 = 0$ 1
 $(p-1)(p+5) = 0$ 1
 $p = 1 \quad p = -5$ 1,1

(q) $4(5x-1) = \frac{-3(5x-1)}{x}$
 $20x^2 - 11x - 3 = 0$ 1
 $(5x+1)(4x-3) = 0$ 1
 $x = -\frac{1}{5} \quad x = \frac{3}{4}$ 1,1

(q) $d = \frac{7-6d}{d}$
 $d^2 + 6d - 7 = 0 \dots\dots\dots 1$
 $(d-1)(d+7) = 0 \dots\dots\dots 1$
 $x = 1 \quad x = -7 \dots\dots\dots 1,1$

(r) $\frac{2m^2+5m}{m+1} = 2$
 $2m^2 + 3m - 2 = 0 \dots\dots\dots 1$
 $(2m-1)(m+1) = 0 \dots\dots\dots 1$
 $x = -2 \quad x = \frac{1}{2} \dots\dots\dots 1,1$

(s) $\frac{3m(m-1)}{m+1} = 2$
 $3m^2 - 5m - 2 = 0 \dots\dots\dots 1$
 $(3m+1)(m-2) = 0 \dots\dots\dots 1$
 $x = 2 \quad x = -\frac{1}{3} \dots\dots\dots 1,1$

(u) $y^2 + 9y - 1 = 3(y - 2)$
 $y^2 + 6y + 5 = 0 \dots\dots\dots 1$
 $(y+1)(y+5) = 0 \dots\dots\dots 1$
 $x = -1 \quad x = -5 \dots\dots\dots 1,1$