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Ex-24(iv)

1. Solve the following quadratic equations;

a) $(x-2)(x-3)=0$

→ Soln,

$(x-2)(x-3)=0$

Either, $x-2=0$

$\therefore x=0+2=2$

Or,

$x-3=0$

$\therefore x=0+3=3$

$\therefore x=2$ or 3.

b) $(x+1)(x-4)=0$

→ Soln,

$(x+1)(x-4)=0$

Either, $x+1=0 \quad \therefore x=0-1=-1$

Or, $x-4=0 \quad \therefore x=0+4=4$

$\therefore x=-1$ or 4

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c) $(x-5)(x+3)=0$

-> Soln,

Either, $x-5=0$

$\therefore x=0+5=5$

Or, $x+3=0$

$\therefore x=0-3=-3$

$\therefore x=5$ or -3

d) $(x+1)(x+8)=0$

-> Soln,

Either,

$x+1=0$

$\therefore x=0-1=-1$

Or,

$x+8=0$

$\therefore x=0-8=-8$

e) $x(x-6)=0$

-> Soln,

Either, $x=0$

Or, $x-6=0$

$\therefore x=0+6=6$

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$5x(x+2)=0$

→ Soln,

Either, $5x=0$

$\therefore x=\frac{0}{5}=0$

Or, $x+2=0$

$\therefore x=0-2=-2$

2. Solve the following quadratic equations;

a) $x^2-4=0$

→ Soln,

$x^2-4=0$

or, $(x)^2-(2)^2=0$

or, $(x+2)(x-2)=0$

Either, $x+2=0$

$\therefore x=0-2=-2$

Or, $x-2=0$

$\therefore x=0+2=2$

$\therefore x=-2$ or 2

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b) $x^2-36=0$

-> Soln,

$x^2-36=0$

or, $(x)^2-(6)^2=0$

or, $(x+6)(x-6)=0$

Either, $x+6=0$

$\therefore x=0-6=-6$

Or, $x-6=0$

$\therefore x=0+6=6$

$\therefore x=-6$ or 6

c) $x^2-100=0$

-> Soln,

$x^2-100=0$

or, $(x)^2-(10)^2=0$

or, $(x+10)(x-10)=0$

Either, $x+10=0$ $\therefore x=0-10=-10$

Or, $x-10=0$ $\therefore x=0+10=10$

$\therefore x=-10$ or 10

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) $4x^2 - 25 = 0$

⇒ Soln,

Here,

$4x^2 - 25 = 0$

or, $(2x)^2 - (5)^2 = 0$

or, $(2x+5)(2x-5) = 0$

Either, $2x + 5 = 0$

or, $2x = 0 - 5$

or, $2x = -5$

or, $x = \frac{-5}{2}$

$\therefore x = \frac{-5}{2}$

Or, $2x - 5 = 0$

or, $2x = 0 + 5 = 5$

$\therefore x = \frac{5}{2}$

$\therefore x = +\frac{5}{2}$ or $\frac{-5}{2}$

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e) $25x^2 - 16 = 0$

-> Soln,

$$25x^2 - 16 = 0$$

or, $(5x)^2 - (4)^2 = 0$

or, $(5x+4)(5x-4) = 0$

Either, $5x + 4 = 0$

or, $5x = 0 - 4 = -4$

or, $x = \frac{-4}{5}$

$\therefore x = \frac{-4}{5}$

Or, $5x - 4 = 0$

or, $5x = 0 + 4$

or, $5x = 4$

or, $x = \frac{4}{5}$

$\therefore x = 4/5$

$\therefore x = \frac{4}{5}$ or $\frac{-4}{5}$

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$9 - 16x^2 = 0$

Soln,

$9 - 16x^2 = 0$

or, $(3)^2 - (4x)^2 = 0$

or, $(3+4x)(3-4x) = 0$

Either, $3 + 4x = 0$

or, $4x = 0 - 3 = -3$

or, $x = \frac{-3}{4}$

$\therefore x = -\frac{3}{4}$

Or, $3 - 4x = 0$

or, $3 - 0 = 4x$

or, $3 = 4x$

or, $\frac{3}{4} = x$

$\therefore x = \frac{3}{4}$

$\therefore x = \frac{3}{4}$ or $-\frac{3}{4}$

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g) $5x^2-45=0$

-> Soln

$5x^2-45=0$

or, $5(x^2-9)=0$

or, $x^2-9=\frac{0}{5}$

or, $x^2-9=0$

or, $(x)^2-(3)^2=0$

or, $(x+3)(x-3)=0$

Either, $x+3=0$

or, $x=0-3$

$\therefore x=-3$

Or, $x-3=0$

or, $x=0+3$

$\therefore x=3$

$\therefore x=3$ or -3.

h) $3x^2-75=0$

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→ Soln

$3x^2-75=0$

or, $3(x^2-15)=0$

or, $x^2-15=0/3$

or, $x^2-15=0$

or, x)

$3\overline{)75}\ 25$

-6

15

-15

x

$3x^2-75=0$

or, $3(x^2-25)=0$

or, $x^2-25=\frac{0}{3}$

or, $x^2-25=0$

or, $(x)^2-(5)^2=0$

or, $(x+5)(x-5)=0$

Either, $x+5=0$

$\therefore x=-5$

or, $x-5=0$

$\therefore x=5$

$\therefore x=-5$ or $+5$

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3. Solve:

a) $x^2 - x = 0$

→ Soln,

$x^2 - x = 0$

or, $x(x-1) = 0$

Either,

$\therefore x = 0$

Or,

$x - 1 = 0$

$\therefore x = 1$

$\therefore x = 0$ or 1

b. $2x^2 - 6x = 0$

→ Soln,

$2x^2 - 6x = 0$

or, $2x(x-3) = 0$

Either, $2x = 0$ $\therefore x = \frac{0}{2} = 0$

Or, $x-3=0$

$\therefore x=0+3=3$

c) $3x^2-15x=0$

⇒ Soln,

$3x^2-15x=0$

or, $3x(x-5)=0$

Either,

$3x=0$

or, $x=\frac{0}{3}$

$\therefore x=0$

Or,

$x-5=0$

$\therefore x=0+5=5$

d) $2x^2+8x=0$

⇒ Soln,

$2x^2+8x=0$

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or, $2x(x+4)=0$

Either,

$2x=0$

$\therefore x=\frac{0}{2}=0$

Or,

$x+4=0$

or, $x=0-4$

$\therefore x=-4$

c) $4x^2+10x=0$

→ Soln,

$4x^2+10x=0$

or, $2x(2x+5)=0$

Either, $2x=0$

$\therefore x=\frac{0}{2}=0$

Or, $2x+5=0$

or, $2x=0-5$

or, $2x = -5$

or, $x = \frac{-5}{2}$

$\therefore x = \frac{-5}{2}$

$5x^2 - 20x = 0$

Soln

Here,

$5x^2 - 20x = 0$

or, $5x(x-4) = 0$

Either, $5x = 0$

$\therefore x = \frac{0}{5} = 0$

Or, $x - 4 = 0$

$\therefore x = 0 + 4 = 4$

Solve the following quadratic equations:

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$x^2-4x+3=0$

Soln,

Here,

$x^2-4x+3=0$

or, $x^2-(1+3)x+3=0$

or, $x^2-x-3x+3=0$

or, $x(x-1)-3(x-1)=0$

or, $(x-1)(x-3)=0$

Either,

$(x-1)=0$

$\therefore x=1$

Or,

$x-3=0$

$\therefore x=3$

$x^2-7x+12=0$

Soln,

$x^2-7x+12=0$

or, $x^2-(3+4)x+12=0$

or, $x^2-3x-4x+12=0$

or, $x(x-3)-4(x-3)=0$

or, $(x-3)(x-4)=0$

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Either, $x-3=0$
$\therefore x=3$

Or, $x-4=0$
$\therefore x=4$

c) $x^2+10x+24=0$

→ Soln,

$x^2+10x+24=0$

or, $x^2+(6+4)x+24=0$

or, $x^2+6x+4x+24=0$

or, $x(x+6)+4(x+6)=0$

or, $(x+6)(x+4)=0$

Either,
$x+6=0$
or, $x=0-6$
$\therefore x=-6$

Or,
$x+4=0$
$\therefore x=-4$

d) $x^2+3x+2=0$

→ Soln,

$x^2+3x+2=0$

or, $x^2+(2+1)x+2=0$

or, $x^2+2x+x+2=0$

or, $x(x+2)+1(x+2)=0$

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or, $(x+2)(x+1)=0$

Either, $x+2=0$
$\therefore x=-2$

| Or, $x+1=0$
$\therefore x=-1$

e) $x^2+9x+20=0$

→ Soln,

$x^2+9x+20=0$
or, $x^2+(5+4)x+20=0$
or, $x^2+5x+4x+20=0$
or, $x(x+5)+4(x+5)=0$
or, $(x+5)(x+4)=0$

20
1 | 20
2 | 10
4 | 5

Either, $x+5=0$
$\therefore x=-5$

| Or, $x+4=0$
$\therefore x=-4$

f) $x^2+11x+30=0$

→ Soln,

$x^2+11x+30=0$
or, $x^2+(5+6)x+30=0$

30
1 | 30
2 | 15
3 | 10
5 | 6

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or, $x^2+5x+6x+30=0$

or, $x(x+5)+6(x+5)=0$

or, $(x+5)(x+6)=0$

Either,

$x+5=0$

$\therefore x=-5$

Or, $x+6=0$

$\therefore x=-6$

g) $x^2+5x-36=0$

→ Soln,

$x^2+5x-36=0$

or, $x^2+(9-4)x-36=0$

or, $x^2+9x-4x-36=0$

or, $x(x+9)-4(x+9)=0$

or, $(x+9)(x-4)=0$

-36	
1	36
2	18
3	12
4	9
6	6

Either,

$x+9=0$

$\therefore x=-9$

Or,

$x-4=0$

$\therefore x=4$ #

h) $x^2+x=42$

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Soln,

$x^2+x=42$

or, $x^2+x-42=0$

or, $x^2+(7-6)x-42=0$

or, $x^2+7x-6x-42=0$

or, $x(x+7)-6(x+7)=0$

or, $(x+7)(x-6)=0$

42	
1	42
2	21
3	14
6	7

Either, $x+7=0$

$\therefore x=-7$

Or, $x-6=0$

$\therefore x=6$ #

$x^2=21-4x$

Soln,

$x^2=21-4x$

or, $x^2+4x-21=0$

or, $x^2+(7-3)x-21=0$

or, $x^2+7x-3x-21=0$

or, $x(x+7)-3(x+7)=0$

or, $(x+7)(x-3)=0$

Either,

$x+7=0$

$\therefore x=-7$

Or,

$x-3=0$

$\therefore x=3$ #

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j) $x^2 - 4x - 5 = 0$

→ Soln, Here,

$$x^2 - 4x - 5 = 0$$

or, $x^2 - (1-5)x - 5 = 0$

or, $x^2 - x + 5x - 5 = 0$

or, $x(x-1) + 5(x-1) = 0$

or, $(x-1)(x+5) = 0$

Either,

$x - 1 = 0$

$\therefore x = 0 + 1 = 1$

Or,

$x + 5 = 0$

$\therefore x = 0 - 5 = -5$

k) $x^2 - 7x - 60 = 0$

→ Soln,

here,

$$x^2 - 7x - 60 = 0$$

or, $x^2 - (12 - 5)x - 60 = 0$

or, $x^2 - 5x + 12x - 60 = 0$

or, $x(x-5) + 12(x-5) = 0$

or, $(x-5)(x+12) = 0$

Either,

$x - 5 = 0$

$\therefore x = 0 + 5 = 5$

Or,

$x + 12 = 0$

$\therefore x = 0 - 12 = -12$

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l. $x^2 = 9x + 22$

→ Soln,

Here,

$x^2 = 9x + 22$

or, $x^2 - 9x - 22 = 0$

or, $x^2 - (2-11)x - 22 = 0$

or, $x^2 - 2x + 11x - 22 = 0$

or, $x(x-2) + 11(x-2) = 0$

or, $(x-2)(x+11) = 0$

Either,	Or,
$x - 2 = 0$	$x + 11 = 0$
$\therefore x = 0 + 2 = 2$	$\therefore x = 0 - 11 = -11$

m) $x^2 - x - 56 = 0$

→ Soln, Here,

$x^2 - x - 56 = 0$

or, $x^2 - (7-8)x - 56 = 0$

or, $x^2 - 7x + 8x - 56 = 0$

or, $x(x-7) + 8(x-7) = 0$

or, $(x-7)(x+8) = 0$

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Either,
$x-7=0$
$\therefore x=0+7=7$

Or,
$x+8=0$
$\therefore x=0-8=-8$

h. $x^2=15-2x$

→ Soln, Here,

$x^2=15-2x$

or, $x^2+2x-15=0$

or, $x^2+(5-3)x-15=0$

or, $x^2+5x-3x-15=0$

or, $x(x+5)-3(x+5)=0$

or, $(x+5)(x-3)=0$

Either,
$x+5=0$
$\therefore x=0-5=-5$

Or,
$x-3=0$
$\therefore x=0+3=3$

#

5. Solve the following quadratic equations:

a) $2x^2-5x+2=0$

→ Soln,

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Here,

$2x^2-5x+2=0$

or, $2x^2-(1+4)x+2=0$

or, $2x^2-x-4x+2=0$

~~or, $x(2x-1)-2x(2x-1)$~~

or, $x(2x-1)-2(2x-1)=0$

or, $(2x-1)(x-2)=0$

Either,

$2x-1=0$

or, $2x=0+1=1$

$\therefore x=\frac{1}{2}$

Or,

$x-2=0$

$\therefore x=0+2=2$

b) $2x^2-9x+9=0$

→ Soln,

$2x^2-9x+9=0$

or, $2x^2-(6+3)x+9=0$

or, $2x^2-6x-3x+9=0$

or, $2x(x-3)-3(x-3)=0$

or, $(x-3)(2x-3)=0$

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Either, $x-3=0$
$\therefore x=0+3=3$

Or, $2x-3=0$
or, $2x=0+3$
$\therefore x=\frac{3}{2}$

c) $3x^2-13x+12=0$

12
x 3
36

→ Soln,
$3x^2-13x+12=0$
or, $3x^2-(9+4)x+12=0$
or, $3x^2-9x-4x+12=0$
or, $3x(x-3)-4(x-3)=0$
or, $(x-3)(3x-4)=0$

Either, $x-3=0$
$\therefore x=0+3=3$

Or, $3x-4=0$
or, $3x=0+4=4$
$\therefore x=\frac{4}{3}$

d. $2x^2+3x-9=0$

→ Soln,
$2x^2+3x-9=0$
or, $2x^2+(6-3)x-9=0$
or, $2x^2+6x-3x-9=0$
or, $2x(x+3)-3(x+3)=0$

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or, $(x+3)(2x-3)=0$

Either, $x+3=0$

$\therefore x=0-3=-3$

or, $2x-3=0$

or, $2x=0+3=3$

$\therefore x=\frac{3}{2}$

e) $3x^2+2x-8=0$

→ Soln,

$3x^2+2x-8=0$

or, $3x^2+(6-4)x-8=0$

or, $3x^2+6x-4x-8=0$

or, $3x(x+2)-4(x+2)=0$

or, $(x+2)(3x-4)=0$

Either, $x+2=0$

$\therefore x=0-2=-2$

or, $3x-4=0$

or, $3x=0+4=4$

$\therefore x=\frac{4}{3}$

f) $2x^2+x-15=0$

→ Soln,

$2x^2+x-15=0$

or, $2x^2+(6-5)x-15=0$

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or, $2x^2+6x-5x-15=0$

or, $2x(x+3)-5(x+3)=0$

or, $(x+3)(2x-5)=0$

Either,

$x+3=0$

$\therefore x=0-3=-3$

Or, $2x-5=0$

Or, $2x=0+5=5$

Or, $x=\frac{5}{2}$

$\therefore x=\frac{5}{2}$

#

→

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Continued from Ex-2.4(iv) No. 5 (g)

5 (g) $4x^2+9x+2=0$

→ Soln,

$4x^2+9x+2=0$

or, $4x^2+(8+1)x+2=0$

or, $4x^2+8x+x+2=0$

or, $4x(x+2)+1(x+2)=0$

or, $(x+2)(4x+1)=0$

Either,

$x+2=0$

$\therefore x=0-2=-2$

Or,

$4x+1=0$

or, $4x=0-1=-1$

$\therefore$ ~~Or~~, $x=\frac{-1}{4}$

5/h $5x^2+6x+1=0$

→ Soln: Here,

$5x^2+6x+1=0$

or, $5x^2+(5+1)x+1=0$

or, $5x^2+5x+x+1=0$

or, $5x(x+1)+1(x+1)=0$

or, ~~5~~ $(x+1)(5x+1)=0$

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Either,
$x+1=0$
$\therefore x=0-1=-1$

Or,
$5x+1=0$
Or, $5x=0-1=-1$
$\therefore x=\frac{-1}{5}$

i) $2x^2+11x+15=0$

→ Soln,
$2x^2+11x+15=0$
or, $2x^2+(6+5)x+15=0$
or, $2x^2+6x+5x+15=0$
or, $2x(x+3)+5(x+3)=0$
or, $(x+3)(2x+5)=0$

Either,
$x+3=0$
$\therefore x=0-3=-3$

Or,
$2x+5=0$
or, $2x=0-5=-5$
$\therefore x=\frac{-5}{2}$

j) $2x^2-3x-14=0$
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→ Soln,

$2x^2 - 3x - 14 = 0$

14
x2
28

or, $2x^2 - (7-4)x - 14 = 0$ $(4-7)$

or, $2x^2 - 4x + 7x - 14 = 0$

or, $2x(x-2) + 7(x-2) = 0$

or, $(x-2)(2x+7) = 0$

Either,
$x - 2 = 0$
$\therefore x = 0 + 2$

Or,
$2x + 7 = 0$
or, $2x = 0 - 7 = -7$
$\therefore x = \frac{-7}{2}$

k) $6x^2 - 7x - 10 = 0$

→ Soln,

$6x^2 - 7x - 10 = 0$

or, $6x^2 - (15 - 12)x - 10 = 0$

or, $6x^2 - 5x + 12x - 10 = 0$

or, $6x(6x-5) + 2(6x-5) = 0$

or, $(6x-5)(x+2) = 0$

Either,
$6x - 5 = 0$
or, $6x = 0 + 5 = 5$
$\therefore x = \frac{5}{6}$

Or,
$x + 2 = 0$
$\therefore x = 0 - 2 = -2$

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$5x^2 - 6x - 8 = 0$

Soln,

$5x^2 - 6x - 8 = 0$

or, $5x^2 - (10 - 4)x - 8 = 0$ (4-10)

~~or, $5x^2 - 10x + 4x - 8 = 0$~~

or, 5

or, $5x^2 - 4x + 10x - 8 = 0$

or, $x(5x-4) + 2(5x-4) = 0$

or, $(5x-4)(x+2) = 0$

Either,	or,
$5x - 4 = 0$	$x + 2 = 0$
or, $5x = 0 + 4 = 4$	$\therefore x = 0 - 2 = -2$
$\therefore x = \frac{4}{5}$	

~~2~~ $7x^2 - 18x + 8 = 0$

Soln

$7x^2 - 18x + 8 = 0$

or, $7x^2 - (14 + 4)x + 8 = 0$

or, $7x^2 - 14x - 4x + 8 = 0$

or, $7x(x-2) - 4(x-2) = 0$

or, $(x-2)(7x-4) = 0$

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Either,
$x-2=0$
$\therefore x=0+2=2$

Or,
$7x-4=0$
or, $7x=0+4=4$
$\therefore x=\frac{4}{7}$

n. $9x^2=5+12x$

→ Soln,
$9x^2=5+12x$
or, $9x^2-12x-5=0$
or, $9x^2-(15-3)x-5=0$
or, $9x^2-15x+3x-5=0$
~~or, $3x(9x-15)+3(\epsilon$~~
or, $3x(3x-5)+1(3x-5)=0$
or, $(3x-5)(3x+1)=0$

Either,
$3x-5=0$
or, $3x=0+5=5$

Or,
$3x+1=$
or, $3x=$

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