9-9-2024. Math.

Unit 4

Ex 4.7

i) $16y^2 - 56y + 49$

$(4y)^2 - 2(4y)(7) + (7)^2$

$(4y - 7)^2$

$\sqrt{(4y-7)^2} = \pm(4y - 7)$ Ans.

2) $25a^4 - 30a^3 + 9a^2$

$(5a^2)^2 - 2(5a^2)(3a) + (3a)^2$

$(5a^2 - 3a)^2$

$\sqrt{(5a^2 - 3a)^2} = \pm(5a^2 - 3a)$ Ans.

$= \pm a(5a - 3)$ Ans.

3) $\left(x^2 - \frac{1}{x^2}\right)^2 + 4\left(x^2 - \frac{1}{x^2}\right) + 4$

$\left(x^2 - \frac{1}{x^2}\right)^2 + 2\left(x^2 - \frac{1}{x^2}\right)(2)^2 + (2)^2$

$\left[x^2 - \frac{1}{x^2} - 2\right)^2$

$\sqrt{\left(x^2 - \frac{1}{x^2}\right)^2} - (2)^2 = x^2 - \frac{1}{x^2} - 2$ Ans.

Q4 $\left[a^2+\frac{1}{a^2}\right]-8\left[a-\frac{1}{a}\right]+19$

$\left[a^2+\frac{1}{a^2}-2\right]-8\left[a-\frac{1}{a}\right]+19+2$

$\left[(a)^2+\left(\frac{1}{a}\right)^2-2(a)\left(\frac{1}{a}\right)\right]-8\left[a-\frac{1}{a}\right]+16$

$\left[a-\frac{1}{a}\right]^2-2\left[a-\frac{1}{a}\right][4]+[4]^2$

$\left[a-\frac{1}{a}-4\right]^2$

$\sqrt{\left[a-\frac{1}{a}-4\right]^2}=\left[a-\frac{1}{a}-4\right]$ Ans.

Q5 $(a+2)(a+4)(a+6)(a+8)+\cancel{A}16$

$(a+2)(a+8)(a+4)(a+6)+\cancel{A}16$

$(a^2+10a+16)(a^2+10a+24)+\cancel{A}16$

Let $a^2+10a=x$

$(x+16)(x+24)+\cancel{A}16$

$(x^2+40x+384)+16$

$x^2+40x+400$

$x^2+20x+20x+400$

$x(x+20)+20(x+20)$

$(x+20)(x+20)$

$(x+20)^2$

Taking square root

$\sqrt{(x+20)^2}$

$\pm(x+20)$

$(a^2+10a+20)=\pm(a^2+10a+20)$ Ans.

Q6 $x^4+8x^3+20x^2+16x+4$

x^2+4x+2

x^2 | $x^4+8x^3+20x^2+16x+4$

$\pm x^4$

$2x^2+4x$ | $8x^3+20x^2$

$\pm 8x^3 \pm 16x^2$

$2x^2+8x+2$ | $4x^2+16x+4$

$\pm 4x^2 \pm 16x \pm 4$

$\times$

$= \pm (x^2+4x+2)$ Ans.

Q7 $x^4+10x^3+31x^2+30x+9$

x^2+5x+3

x^2 | $x^4+10x^3+31x^2+30x+9$

$\pm x^4$

$2x^2+5x$ | $10x^3+31x^2$

$\pm 10x^3 \pm 25x^2$

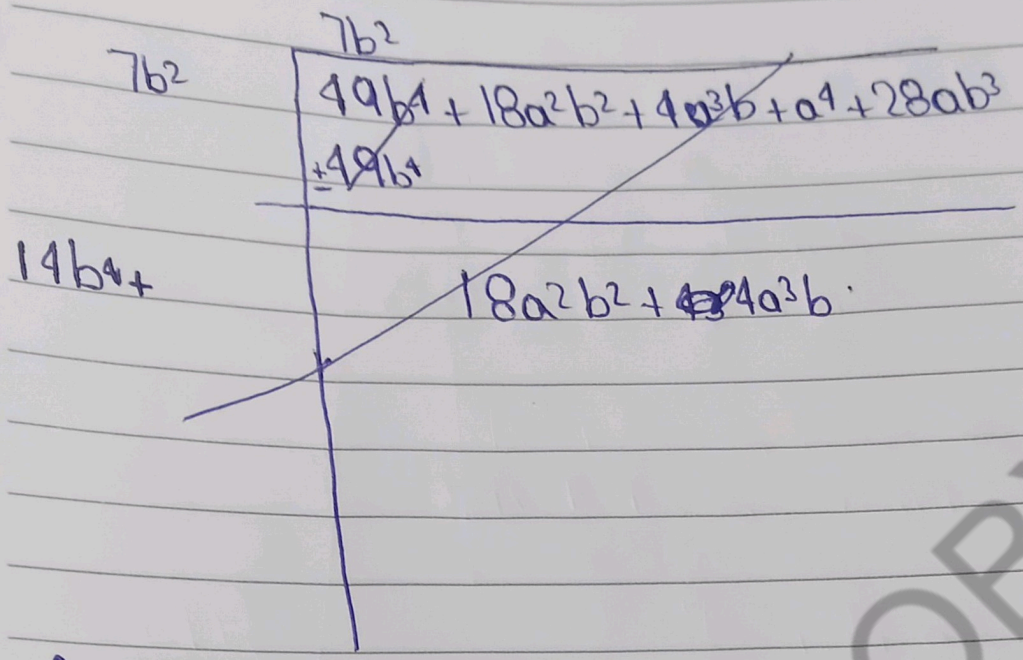
$2x^2+10x+3$ | $6x^2+30x+9$

$\pm 6x^2 \pm 30x \pm 9$

$\times$

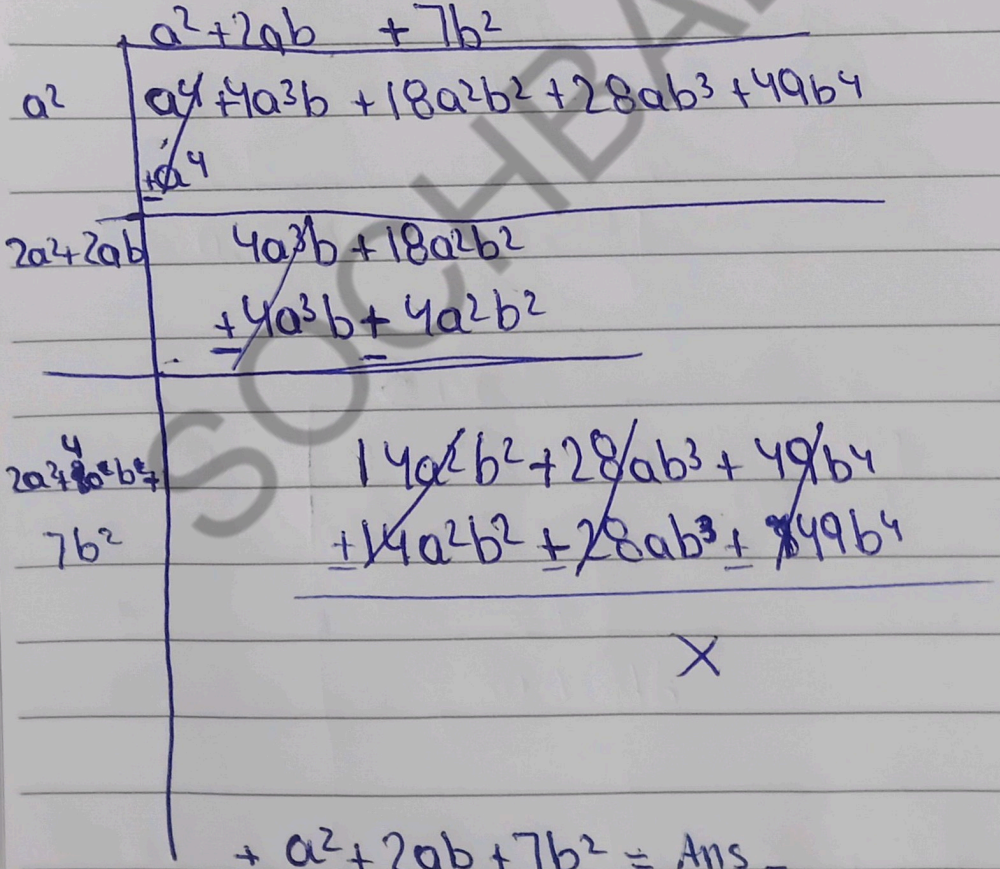
$= \pm x^2+5x+3$ Ans.

Q8 $49b^4 + 18a^2b^2 + 4a^3b + a^4 + 28ab^3$



frist arrange the value.

$a^4 + 4a^3b + 18a^2b^2 + 28ab^3 + 49b^4$



$\pm a^2 + 2ab + 7b^2$ = Ans.

Q9 $4x^4 - 12x^3 + 29x^2 - 30x + 25$

$2x^2 - 3x + 5$

$2x^2$ | $4x^4 - 12x^3 + 29x^2 - 30x + 25$

$\pm 4x^4$

$-12x^3 + 29x^2$

$\mp 12x^3 \pm 9x^2$

$4x^2 - 3x$

$20x^2 - 30x + 25$

$\pm 20x^2 \mp 30x \pm 25$

$4x^2 - 6x + 5$

X

$2x^2 - 3x + 5$ ~~Ans~~

$\pm 2x^2 - 3x + 5 = Ans.$

Q10 $1 - 10x + 27x^2 - 10x^3 + x^4$

$1 - 5x + (x)^2$

1 | $1 - 10x + 27x^2 - 10x^3 + x^4$

± 1

$2 - 5x$

$-10x + 27x^2$

$-10x \pm 25x^2$

$2 - 10x + x^2$

$2x^2 - 10x^3 + x^4$

$\pm 2x^2 \mp 10x^3 \pm x^4$

X

$\pm 1 - 5x + x^2 = Ans.$

Q11 $x^4+\frac{1}{x^4}+4x^2-\frac{4}{x^2}+2,\ x\neq 0$

$x^4+4x^2+2-\frac{4}{x^2}+\frac{1}{x^4}$

$x^2+2+\frac{1}{x^2}$

x^2 | $x^4+4x^2+2-\frac{4}{x^2}+\frac{1}{x^4}$

$\pm x^4$

$2x^2+2$ | $4x^2+2$

$\pm 4x^2\pm 4$

$2x^2+4+\frac{1}{x^2}$ | $-2-\frac{4}{x^2}+\frac{1}{x^4}$

$+2+\frac{4}{x^2}+\frac{1}{x^4}$

X

$\pm x^2+2+\frac{1}{x^2}$ Ans.

Q12 $a^2-8a+2+\frac{56}{a}+\frac{49}{a}$

$a-4-\frac{7}{a}$

a | $a^2-8a+2+\frac{56}{a}+\frac{49}{a}$

$\pm a^2$

$2a-4$ | $-8a+2$

$\mp 8a\pm 16$

$2a-8-\frac{7}{a}$ | $-14+\frac{56}{a}+\frac{49}{a}$

$+14+\frac{56}{a}+\frac{49}{a}$

X

$\pm a-4-\frac{7}{a}$ Ans.

Q13 $x^4 - 2x^3 + \frac{3x^2}{2} - \frac{x}{2} + \frac{1}{16}$

$x^2 - x + \frac{1}{4}$

x^2 | $x^4 - 2x^3 + \frac{3x^2}{2} - \frac{x}{2} + \frac{1}{16}$

$\pm x^4$

$2x^2 - x$ | $-2x^3 + 3x^2$

$-2x^3 \pm x^2$

$2x^2 - 2x + \frac{1}{4}$ | $\frac{1}{2}x^2 - \frac{x}{2} + \frac{1}{16}$

$\pm \frac{1}{2}x^2 \mp \frac{x}{2} \pm \frac{1}{16}$

X

$\pm x^2 - x + \frac{1}{4}$ Ans.

Q14) $4x^4 + 32x^2 + 96 + \frac{64}{x^4} + \frac{28}{x^2}$

$2x^2 + 8 + \frac{8}{x^2}$

$2x^2$ | $4x^4 + 32x^2 + 96 + \frac{64}{x^4} + \frac{28}{x^2}$

$\pm 4x^4$

$4x^2 + 8$ | $32x^2 + 96$

$\pm 32x^2 \pm 64$

$4x^2 + 16 + \frac{8}{x^2}$ | $32 + \frac{64}{x^4} + \frac{128}{x^2}$

$\pm 32 \pm \frac{64}{x^4} \pm \frac{128}{x^2}$

X

$\pm 2x^2 + 8 + \frac{8}{x^2}$ Ans.

$4x^2\left(\frac{8}{x}\right)$

$4x^2\left(\frac{8}{x^2}\right)$

Q15) $a^4 - 10a^3 + 27a^2 - 9a + 2a$

$a^2 - 5a + 1$

a^2 | $a^4 - 10a^3 + 27a^2 - 9a + 2a$

a^4

$2a^2 - 5a$ | $-10a^3 + 27a^2$

$\mp 10a^3 \pm 25a^2$

$2a^2 - 10a + 1$ | $2a^2 - 9a + 2$

$\pm 2a^2 \mp 10a \pm 1$

$a + 1$

i) What should be added = $(-a-1)$ Ans.

ii) What should be subtracted from it = $(a+1)$ Ans.

iii) What will be the value of a =

-1 will be the value of a.

added

$a + x - a - 1$

Subtracted

$a + x$

$-a \mp 1$

$a + 1 = 0$

$a = -1$

Q16 Find the value of p and q if $x^4 - 12x^3 + px + q$ is a complete s

$x^2 - 6x - 18$

x^2 | $x^4 - 12x^3 + px + q$

$\mp x^4$

$2x^2 - 6x$ | $-12x^3 + px$ px

$\mp 12x^3 \pm 36x^2$

$2x^2 + 12x + 18$ | $-36x^2 + px + q$

$\mp 36x^2 \pm 216x \pm 324$

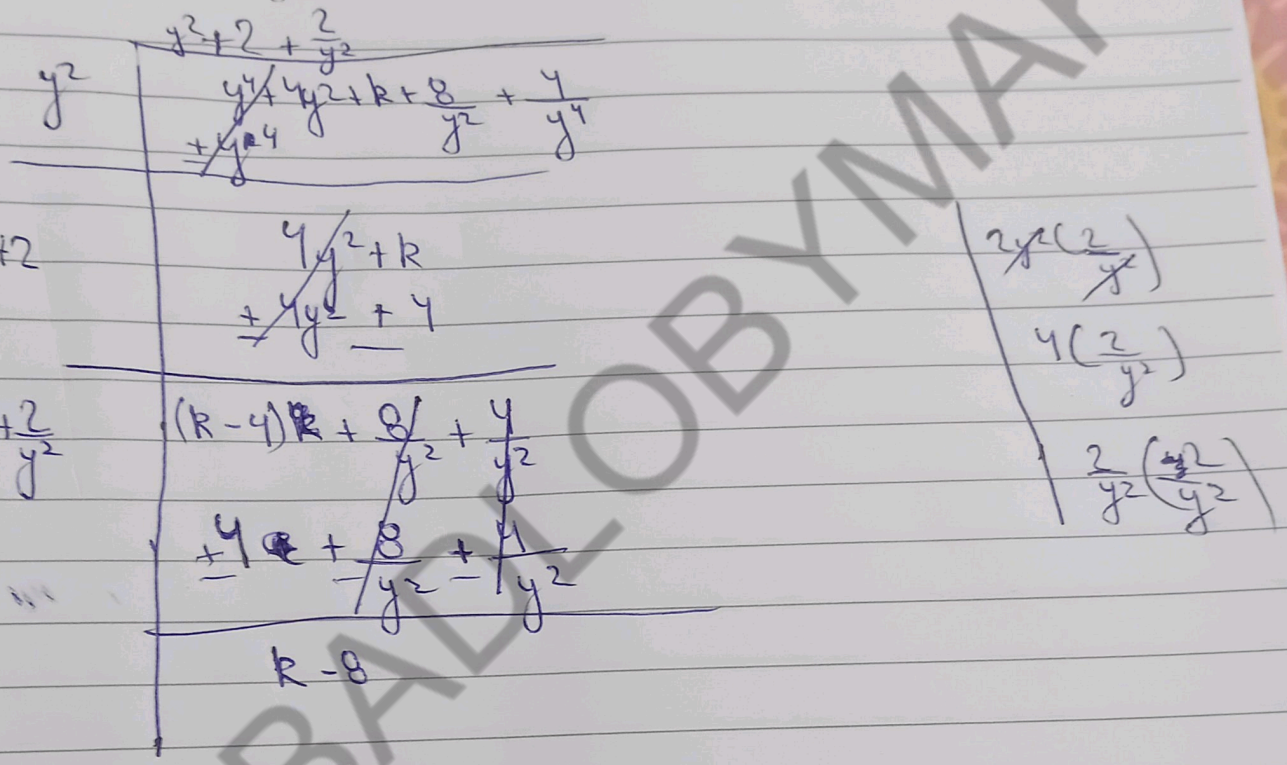
$(p - 216)x + (q - 324)$

because expreesion is a pefect square so

$p - 216 = 0$, $q - 324 = 0$

$p = 216$ $q = 324$. Ans.

Q17 $y^4 + 4y^2 + k + \frac{8}{y^2} + \frac{4}{y^4}$



To became a perfect square

$k - 8 = 0$

$k = 8$ Ans.