Jewel's Care ${ }^{\text {Life is for motto lesson }}$


## প्रশ্नমाना 3.1

1. मृৰ्बार माशाख्या वर्ध निर्णय़ कर: (i) $a+3 b$
(ii) $\mathrm{ab}-\mathrm{c}$
(iii) $x^{2}+\frac{2}{y^{2}}$
(iv) $3 p+4 q-5 r$
(v) $\frac{a}{2}+\frac{2}{b}-\frac{1}{c}$
(vi) 996 (vii) $a x-b y-c z$
2. সর্লল बर :
(i) $(4 x+7 y-3 z)^{2}+2(4 x+7 y-3 z)(7 y-4 x+3 z)+(7 y-4 x+3 z)^{2}$
(ii) $(a-b+c)^{2}-2(b+c-a)(a-b+c)+(b+c-a)^{2}$
(iii) $\frac{8.625 \times 8.625-2 \times 8.625 \times 6.375+6.375 \times 6.375}{8.625-6.375}$


$$
x-\frac{1}{x}=a \text { इलে, } x^{2}+\frac{1}{x^{2}} \text { जর मान रण? }
$$

5. $\mathrm{a}+\mathrm{b}=7 \mathrm{p}$ এবং $\mathrm{ab}=12 \mathrm{p}^{2}$ इलে, $\mathrm{a}-\mathrm{b}$ बর মাन रण?
6. $x-y=2$ এবः $x y=3$ रून, $x+y$ এর মাन কত?

म. $x+\frac{1}{x}=2$ হलে, $x^{4}+\frac{1}{x^{4}}$ এর মাन रणण?
48. यमि $x+\frac{1}{x}=4$ श़, उद大ে $\frac{1}{x^{2}-3 x+1}$ जर घान कण?
9. $x+y=12$ এবश $x-y=2$ इलে, (i) $x^{2}+y^{2}$ बর মान कण? (ii) $x y$ बज मान कढ ? $:=$

पु0. $a+b=\sqrt{3}$ बবং $a-b=\sqrt{2}$ रलে, প্রমাণ কর बে, $8 a b\left(a^{2}+b^{2}\right)=5$
11. 45 तब দूইঢि বर्भाর বিয়োগएन রৃषে প্রकाल कन।
12. $\mathrm{x}+\mathrm{y}+\mathrm{z}=15$ এবе $\mathrm{x}^{2}+\mathrm{y}^{2}+\mathrm{z}^{2}=83$ হलে, $\mathrm{xy}+\mathrm{yz}+\mathrm{zx}$ जর মাन बळ?
413. $x+y+z=p$ बबए $x y+y z+z x=q$ शबन, $(x+y)^{2}+(y+z)^{2}+(z+x)^{2}$ बा मान दठ?
D. $\mathrm{a}+\mathrm{b}+\mathrm{c}=10$ এबर $\mathrm{a}^{2}+\mathrm{b}^{2}+\mathrm{c}^{2}=38$ रून, $(\mathrm{a}-\mathrm{b})^{2}+(\mathrm{b}-\mathrm{c})^{2}+(\mathrm{c}-\mathrm{a})^{2}$ बबा मान कठ ?
45. $x-\frac{1}{x}=p$ रल. $\frac{c}{x(x-p)}$ जब मान निर्णा कब।
16. तथा० क. $\left\{\left(\frac{x+y}{2}\right)^{2}-\left(\frac{x-y}{2}\right)^{2}\right\}^{2}=\left(\frac{x^{2}+y^{2}}{2}\right)^{2}-\left(\frac{x^{2}-y^{2}}{2}\right)^{2}$

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 $\mathrm{p}=3+\frac{1}{\mathrm{p}}$ रल, व्रमाण दू त, $\mathrm{p}^{4}=119-\frac{\mathrm{I}}{\mathrm{p}^{4}}$
$x=\sqrt{3}+\sqrt{2}$ रलन, $x^{2}+\frac{1}{x^{2}}$ जन मान निर्षयक्न कत।
20. $x=b-c, y=c-a, z=a-b$ रल, $x^{2}-y^{2}+z^{2}+2 x z$ जबत मान निर्णग़ बत्र।
21. $x^{2}+8 x-20$ बह मूरोी वलान अवुतनृष्य धदाल क्न।

## भाधायिक बीज़वर्००

广দाइন্নণ 10. यमि $x-y=8$ এবং $x y=65$ इয়, उরে $x^{3}-y^{3}-16(x-y)^{2}$ এর মাन <उ?
गसाथान : $x^{3}-y^{3}-16(x-y)^{2}=(x-y)^{3}+3 x y(x-y)-16(x-y)^{2}$
$=8^{3}+3.65 .8-16.8^{2}=8(64+195-128)$

$$
=8(64+67)=8 \times 131=1048 .
$$

উদাহরণ 11. সরন কর :

$$
(a-b)\left(a^{2}+a b+b^{2}\right)+(b-c)\left(b^{2}+b c+c^{2}\right)+(c-a)\left(c^{2}+c a+a^{2}\right)
$$

गमाथान : $(\mathrm{a}-\mathrm{b})\left(\mathrm{a}^{2}+\mathrm{ab}+\mathrm{b}^{2}\right)+(\mathrm{b}-\mathrm{c})\left(\mathrm{b}^{2}+\mathrm{bc}+\mathrm{c}^{2}\right)+(\mathrm{c}-\mathrm{a})\left(\mathrm{c}^{2}+\mathrm{ca}+\mathrm{a}^{2}\right)$

$$
=a^{3}-b^{3}+b^{3}-c^{3}+c^{3}-a^{3}=0
$$

## প্রশ্নমালা 3.2

1. গুণফল निক্য় কর : (i) $(\mathrm{a}+\mathrm{x})(\mathrm{b}+\mathrm{x})(\mathrm{c}+\mathrm{x})$ (ii) $(4+\mathrm{x})(3+\mathrm{x})(2+\mathrm{x})$
2. घन निर्ণয় কর : (i) $3 x-4 y$ (ii) $a-b+c$ (iii) 403
3. সরল কর:
(i) $(x+y)\left(x^{2}-x y+y^{2}\right)+(y+z)\left(y^{2}-y z+z^{2}\right)+(z+x)\left(z^{2}-z x+x^{2}\right)$
(ii) $(4 a-3 b)^{3}-3(4 a-3 b)^{2}(2 a-3 b)+3(4 a-3 b)(2 a-3 b)^{2}-(2 a-3 b)^{3}$
(iii) $(a+b+c)^{3}-(a-b-c)^{3}-6(b+c)\left\{a^{2}-(b+c)^{2}\right\}$
4. $\mathrm{x}=19$ \& $\mathrm{y}=-12$ रून, $8 x^{3}+36 x^{2} \mathrm{y}+54 x \mathrm{y}^{2}+27 \mathrm{y}^{3}$ जর মान निर्ণয় कर।
5. $\mathrm{a}+\mathrm{b}=3$ এবং $\mathrm{ab}=2$ रूে, $\mathrm{a}^{3}+\mathrm{b}^{3}$ এর মাन बिি্ণয় कর। व
6. यमि $\mathrm{a}^{3}-\mathrm{b}^{3}=513$ এবং $\mathrm{a}-\mathrm{b}=3$ रয়, उ C ab এর मान बত? - है

ป7. $\mathrm{a}+\mathrm{b}=\mathrm{c}$ रूে, দেখাও बে, $\mathrm{a}^{3}+\mathrm{b}^{3}+3 \mathrm{abc}=\mathrm{c}^{3}$
8. यमि $x+\frac{1}{x}=\sqrt{3}$ इग़, তबে $\mathrm{x}^{3}+\frac{1}{\mathrm{x}^{3}}$ এर मान कण?
9. $\mathrm{a}-\mathrm{b}=5$ बবং $\mathrm{ab}=36$ रूে, $\mathrm{a}^{3}-\mathrm{b}^{3}$ बর घान रण?
10. यमि $a+b=m, a^{2}+b^{2}=n$ बবং $a^{3}+b^{3}=p^{3}$ शয়, उबে नেথाও बে, $m^{3}+2 p^{3}=3 m n$. ०
(11. $x+y=5$ এবং $x y=6$ रणन, $x^{3}+y^{3}+4(x-y)^{2}$ जর মान निर्ণয় কर।
12. $2 \mathrm{x}-\frac{1}{3 \mathrm{x}}=5$ रबে, $4 \mathrm{x}^{2}+\frac{1}{9 \mathrm{x}^{2}}$ - $8 \mathrm{x}^{3}-\frac{1}{27 \mathrm{x}^{3}}$ এর मान निबड़ कर।
13. $\frac{\mathrm{a}}{\mathrm{b}}+\frac{\mathrm{b}}{\mathrm{a}}=6$ रनে, $\frac{\mathrm{a}^{2}}{\mathrm{~b}^{2}}+\frac{\mathrm{b}^{2}}{\mathrm{a}^{2}}$ এर मान निर्षয় करा
14. $\mathrm{x}=\sqrt{3}+\sqrt{2}$ रून, $\mathrm{x}^{3}+\frac{1}{\mathrm{x}^{3}}$ बर मान निर्बय़ कर।
(15.) $2 x-\frac{2}{x}=3$ रूल, भ्रमाब कर बय, $8\left(x^{3}-\frac{1}{x^{3}}\right)=63$.

## ब্रশूমাनা 3.3

উৎপাদরক বিশ্মেষণ কর :

1. $3 a^{2} b+6 a b^{2}+12 a^{2} b^{2}$
2. $a x+b y+b x+a y$
3. $a b+a-b-1$
4. $\left(a^{2}-b^{2}\right)\left(x^{2}-y^{2}\right)+4 a b x y G$
5. $4 x^{2}-y^{2}-z^{2}+2 y z$
6. $x^{4}+x^{2}+25$
7. $a^{2}-b^{2}-2 a c+2 b c$
8. $a^{4}-27 a^{2}+1$
9. $\mathrm{a}^{2}-1+2 \mathrm{~b}-\mathrm{b}^{2}$
10. $a^{3}+8$
11. $x^{3}+3 x^{2}+3 x+2$
12. $a^{3}-9 b^{3}+(a+b)^{3}$
13. $a y+a-y^{2}-2 y-1$
14. $x^{3}+3 \sqrt{3}$
15. $a(x+5 y)+3 b(x+5 y)$
16. $1+a+b+a b$
17. $a^{2}-c^{2}-2 a b+b^{2}$
18. $(a+b-3 c)^{3}-a-b+3 c G$
19. $a^{4}+4$
20. $12 a^{4}+3 b^{4}$
21. $x^{4}+2 x^{2}+9$
22. $2 a b-a^{2}-b^{2}+c^{2} G, A$
23. $(\mathrm{R}-2 \mathrm{r})^{2}-\mathrm{r}^{2}$
24. $\mathrm{m}^{4}-8 \mathrm{~m}$
25. $8-a^{3}+3 a^{2} b-3 a b^{2}+b^{3}$
26. $m^{3}-n^{3}-m\left(m^{2}-n^{2}\right)+n(m-n)^{2}$
27. $\sqrt{2 x}+2 x^{2}$
28. $A R^{3}-A r^{3}+A R^{2} h-A r^{2} h$
29. $x^{2}+3 x-a^{2}-a+2$ [Hints : প্रদब्ठ রाশि $\left.=x^{2}-a^{2}+2 x-2 a+x+a+2\right] G c \circ$ of
30. $x(x+3)(x+4)(x-1)+4$ Ge. $A$
31. $16 x^{2}-25 y^{2}-8 x z+10 y z G$
32. $4 \pi(\mathrm{R}+\mathrm{r})^{3}-4 \pi \mathrm{R}^{3}$
33. $\frac{1}{2} m(v+2 u)^{2}-\frac{1}{2} m(v+u)^{2}$
34. $2 \sqrt{2} x^{3}+125 ; A$

## প্রশ্নমালা 3.4

উৎপাদকে বিল্লেষণ কর :

1. $x^{2}+x-20$
2. $x^{2}-8 x-20$
3. $x^{2}-12 x+20$
4. $x^{2}-19 x-20$
5. $x^{2}-21 x+20$
6. $y^{2}+2 y-3$
7. $u^{2}-30 u+216$
8. $a^{4}+4 a^{2}-5$
9. $x^{4}-10 x^{2}+16$
10. $x^{6}-7 x^{3}+12$
11. $x^{6} y^{6}-x^{3} y^{3}-6$
12. $a^{8}-a^{4}-2$
13. $(x+y)^{2}-4(x+y)-12$
14. $\left(x^{2}+2 x\right)^{2}+12\left(x^{2}+2 x\right)-45 G$
15. $y^{2}-2 a y+(a+b)(a-b)$
)К. $x^{2}-x-\left(a^{2}+5 a+6\right)$ \&
Yケ. $x^{2}-\left(a+\frac{1}{a}\right) x+1$ 18. $x^{2}-\left(\frac{2}{a}-3 a\right) x-66$.月
16. $x^{2}+x-(a+1)(a+2)$
17. $x^{4}+3 x^{3}-5 x^{2}-15 x$ Ge, $A$

## প্রশ্নমালা 3.5

## উৎপাদকে বিশ্মেষণ কর :

1. $4 a^{2}+11 a+6$
2. $7 \mathrm{p}^{2}-\mathrm{p}-8$
3. $35 \mathrm{x}^{2}-\mathrm{x}-12$.
4. $5(x+y)^{2}+18\left(x^{2}-y^{2}\right)-8(x-y)^{2}$
5. $(\mathrm{a}+\mathrm{b}) \mathrm{x}^{2}-2 \mathrm{ax}+(\mathrm{a}-\mathrm{b})$
6. $(a-1) x^{2}+a^{2} x y+(a+1) y^{2}$
7. $19 \mathrm{x}-6+7 \mathrm{x}^{2}$
8. $6 p^{2}-11 p-150$
9. $4(x+1)(2 x+3)(3 x+2)(6 x+1)-6$
10. $(a-m) x^{2}-(x-a) x y+(m-x) y^{2}$,
11. $\frac{1}{2} \mathrm{p}^{2}-3 \mathrm{p}+4$
12. $3 y^{2}+11 y+6$
13. $4 \mathrm{x}^{2}+5 \mathrm{x}-6$
14. $a(a+1)(a+2)(a+3)-15$
15. $(x+1)(x+3)(x-4)(x-6)+24$

প্রশूমালা 3.6
উৎপাদকে বিশ্নেষণ কর :

1. $a^{3}-21 a-20$
2. $x^{3}+6 x^{2}+11 x+6$
3. $a^{3}-3 a^{2} b+2 b^{3}$
4. $x^{3}+3 x+36$
5. $a^{4}-4 a+3$
6. $2 a^{3}-3 a^{2}+3 a-1$ Gوी
7. $x^{3}-3 x^{2}+4 x-4 A$
8. $x^{6}-x^{5}+x^{4}-x^{3}+x^{2}-x$
9. $x^{3}+6 x^{2} y+11 x y^{2}+6 y^{3}$
10. $12+4 x-3 x^{2}-x^{3}$
11. $2 x^{4}-3 x^{3}-3 x-2$
12. $3 a^{3}+2 a+5$

## প्रশ্नমালা 3.7

भ. সा. भू. निर्षय़ कन्न (প্রশ্न 1 बে<ে 4) :

1. $x^{2}+x, x^{2}+2 x+1$
2. $a^{3}-b^{3}, a^{3}+b^{3}$
3. $a^{2}-b^{2}-c^{2}-2 b c, b^{2}-c^{2}-a^{2}-2 c a, c^{2}-a^{2}-b^{2}-2 a b$
4. $x^{2}-11 x+30, x^{3}-4 x^{2}-2 x-15$

ๆ. ना. शू. निर्बग़्न बর (প্রল্न 5 वেকে 10 ):
5. $x^{2}+3 x+2, x^{2}-1, x^{2}+x-2$
6. $x^{3}-1, x^{3}+1, x^{4}+x^{2}+1$
t $x^{2}-x(a-c)-a c, x^{2}-x(a+c)+a c, a x^{3}-a^{3} x$
8. $x^{3}-x^{2}-3 x-9, x^{3}-2 x^{2}-2 x-3$
9. $4 x^{2}+8 x-12,9 x^{2}-9 x-54,6 x^{4}-30 x^{2}+24$
10. $x\left(4-x^{2}\right), x^{4}+6 x^{3}+8 x^{2}, x^{2}+2 x-8$

N1. यमि $\mathrm{x}^{2}+\mathrm{px}+\mathrm{q}$ এবং $\mathrm{x}^{2}+\mathrm{p} \mathrm{x}+\mathrm{q}$ जর গ. गा. গू. $(\mathrm{x}+\mathrm{a})$ इसा, उटে প্रमान क्त बে,
$(\mathrm{p}-\mathrm{p}) \mathrm{a}=\mathrm{q}-\mathrm{q}^{\prime}$.

## প्रশूसाना 3.8 .


















 इल। क巨 সময়ে পिभाটি পৃর্ণ হরে?





 x बে y धरन खाशन डूल्ध ध्रकाल कर।





21. ढেनिखোনের কলের সश्थ্যা 173 , প্রতিকলের মূল্য 170 টাকা, তার ভাড়া 150 টাকা এবং जাট 150 হলে, টেলিফোন বিলের ও ড্যাটের পরিমাণ নির্ণয় কর।

 প্রত্যেককে কত কর্রে ভাড়া দিতে হন?
$3 \times$ এক মাঝি ভ্বোতের প্রতিকূলে $t_{1}$ घণ্টায় $d$ कि. মি. যেতে পারে। স্রোতের অনুকृলে ঐ পथ যেতে তার $t$ লাগে। স্বোতের বেগ ও নৌকার বেগ কত?

 প্রত্যেক সসন্তান বিধবা, প্রত্যেক निঃসন্তান বিষবার দ্গিগুণ চাল পেলে দেখাও বে, সসন্তান প্রত্যেক বিষবा পাত্ত চালের পরিমাণ
$\frac{\mathrm{p}}{\mathrm{m}}\left[1-\left\{\frac{1}{8}+\left(1-\frac{1}{8}\right)\right.\right.$ এর $\left.\left.\frac{\mathrm{n}}{2 \mathrm{~m}+\mathrm{n}}\right\}\right]$ কে. জি.।
$\mathrm{p}=112, \mathrm{~m}=14$ এবश $\mathrm{n}=7$ হलে, প্রত্যেক সসठ্তান বিধবার প্রাপ্ত চালের পরিমাণ কত?
[বिঃ प্রঃ বিতরণে সাহাय্যকারীর স্থলে মা, সসন্তান বিধবার স্থলে ডাই এবং নিঃসন্তান বিধবার স্থলে বো বিবেচনাं করেেে মুসলিম জাইনের ফরায়েcে উপর্রাক্ত সৃত্র প্রয়োগ করে ভাই-বোনের অংশ নির্ণয় কর্木া যায়



(1) $(a+b)^{2}=a^{2}+2 a b+b^{2}$
(2) $(a-b)^{2}=a^{2}-2 a b+b^{2}$
(3)

$$
\begin{aligned}
a^{2}+b^{2} & =(a+b)^{2}-2 a b \\
& =(a-b)^{2}+2 a b \\
& =\frac{(a+b)^{2}+(a-b)^{2}}{2}
\end{aligned}
$$

(4) $2\left(a^{2}+b^{2}\right)=(a+b)^{2}+(a-b)^{2}$
(7) $4 a b=(a+b)^{2}-(a-b)^{2}$
(8) $a b=\left(\frac{a+b}{2}\right)^{2}-\left(\frac{a-b}{2}\right)^{2}$
(9) $a^{2}-b^{2}=(a+b)(a-b)$
(10) $(a+b+c)^{2}=a^{2}+b^{2}+c^{2}+2(a b+b c+c a)$
(11) $a^{2}+b^{2}+c^{2}=(a+b+c)^{2}-2(a b+b c+c a)$
(11) $2(a b+b c+c a)=(a+b+c)^{2}-\left(a^{2}+b^{2}+c^{2}\right)$
(12) $(p+\underbrace{}_{1}(q+2 x)=p q+(p+q) x+x^{2}$


$$
\begin{aligned}
& \text { (1) (1) }(a+3 b) \text {-बत वर्ग रास् } \\
& =(a+3 b)^{2} \\
& =(a)^{2}+2 \cdot a \cdot 3 b+(3 b)^{2} \\
& =a^{2}+6 a b+9 b^{2}
\end{aligned}
$$

$$
\text { Ans: } a^{2}+6 a b+9 b^{2}
$$

(ii) $a b-c$ (1) $a 1+98)$

$$
\text { Ans: } a^{2} b^{2}-3 a b c+c^{2}
$$



$$
\begin{aligned}
& =a^{2} b^{2}-2 a b e t \text { ch Jewel's care Hand Noter }
\end{aligned}
$$

## (11) $3 p+4 q-5 p$


$=(3 p+4 q-5 p)^{2}$
$=\{(3 p+4 q)-5 p)\}^{2}$
$=(3 p+4 q)^{2}-2 \cdot(3 p+4 q) \cdot 5 p+(5 p)^{2}$
$=(3 p)^{2}+2 \cdot 3 p \cdot 4 q+(4 q)^{2}-10 p(3 p+4 q)+25 p^{2}(111)$
$=9 p^{2}+24 p q+16 q^{2}-30 p r-40 q p+25 p^{2}$
$=9 p^{2}+16 q^{2}+25 p^{2}+24 p q-30 p p^{2}-40 q p$
Ans: $9 p^{2}+16 q^{2}+25 p^{2}+24 p q-30 p p-40 q r$

$=\left(\frac{a}{2}+\frac{q}{b}-\frac{1}{c}\right)^{2}$
$=\left\{\left(\frac{a}{2}+\frac{2}{b}\right)-\frac{1}{c}\right\}^{2}$
$=\left(\frac{a}{2}+\frac{2}{b}\right)^{2}-2\left(\frac{a}{2}+\frac{2}{b}\right) \frac{1}{c}+\left(\frac{1}{c}\right)^{2}$
$=\left(\frac{a}{2}\right)^{2}+2 \cdot \frac{a}{2} \cdot \frac{2}{b}+\left(\frac{2}{b}\right)^{2}-\frac{2}{c}\left(\frac{a}{2}+\frac{2}{b}\right)+\frac{1}{c}{ }^{2}+4 x=$
$=\frac{a^{2}}{4}+\frac{2 a}{b}+\frac{4}{b^{2}}-\frac{a}{c}-\frac{4}{b e}+\frac{1}{e^{2}}+\frac{x}{y}+40 r$ cart
$=\frac{a}{4}+\frac{4}{b^{2}}+\frac{1}{c^{2}}+\frac{2 a}{b}-\frac{a}{c}-\frac{4}{b c}$
Ans:...

$$
g=z E-\mu F+\left(x^{\circ}\right.
$$

$$
\sim(d+A)=a-b
$$

Hns: 992016.
ewel's care Mand Note

$$
=(a x-b y-c z)^{2}
$$

$$
=\{(a x-b y)-c z\}^{2}
$$

$$
\begin{aligned}
& =\{(a x-b y)-(z\} \\
& =(a x-b y)^{2}-2(a x-b y) c z+(c z)^{2},
\end{aligned}
$$

$$
\begin{aligned}
& =(a x-b y)^{2}-2(a x-1)+z^{2} \\
& =(a x)^{2}-2 \cdot a x \cdot b y+(b y)^{2}-2 c z(a x+b y)+c^{2}+d^{2}
\end{aligned}
$$

$$
\begin{aligned}
& t(b y)^{2}-2 c z @+c^{2} \\
& +b^{2} y^{2}-2 a c x z-2 b c y z+c^{2}
\end{aligned}
$$

$$
\begin{aligned}
& =a^{2} x^{2}-2 a b x y+b^{2} y^{2}-2 a c x z-2 b c y z \\
& =a^{2} x^{2}+b^{2}+y^{2}+c^{2} z^{2}-2 a b x y-2 a c x z-2 b c y z .
\end{aligned}
$$

Ans: $a^{2} x^{2}+b^{2} y^{2}+c^{-} z^{2}-a^{2} a b x y-2 a c x z-2 b e y z$.

$$
-(08)
$$



$$
\begin{aligned}
& \text { (vii) } 996 \text { - - वर्ग दाव़ा } \\
& =(996)^{2} \\
& =(1000-4)^{2} \\
& =(100)^{2}-2 \cdot 1000.4+(4)^{2} \\
& =1000000-8800+16 \\
& \Rightarrow 10016-8000 \\
& =992016 \text {. } \\
& \text { Ans:992016. }
\end{aligned}
$$


(2) (1) $\frac{\mathcal{S}}{4}$ जि,

$$
4 x+7 y-3 z=a
$$

$$
7 y-4 x+3 z=b
$$

$$
\therefore \text { परिड दाभआआना }=a^{2}+2 a b+b^{2}
$$

$$
=(a+b)^{2}
$$

$$
\begin{aligned}
& =(a+b) \\
& =(4 x+7 y-3 z+7 y-4 x+3 z)=c
\end{aligned}
$$

$$
=(14 y)^{2}
$$

$$
. \partial 10 s e c e ~ c r t h \mid
$$

$$
=196 y^{2} \text { res oin }(59-\operatorname{cd}-x(9))(142)
$$

a. Ans: $196 y^{2}$

$$
-8=-(0)-(\theta)=
$$

(11) हौन्रि,

$$
\begin{aligned}
& b+c-a=y \\
& 3 \text { सानामा }=x^{2}-2 y x+y^{2}
\end{aligned}
$$

$$
\begin{aligned}
& =x^{2}-2 x y+y^{2}+40 x-550= \\
& =(x-y)^{2}-2 y^{2}+2 x+2 x+0= \\
& =(2 a) 4 \\
& =4 a^{2}
\end{aligned}
$$

(3) तुज्या आचू.

$$
x=\frac{1}{8}
$$

$$
y=8=4+19991=d 0
$$

 37, $x+y=(8 x)^{2}+2.8 x \cdot 6 y+(6 y)^{2}+y^{2}$

$$
\begin{aligned}
& \text { (3) यदि } \\
& 4 x^{2}+1(69+x 8) \\
& 8.625=a \\
& \text {-(d) } \left.+(1 \times x)+\frac{1}{5} \times 8\right)= \\
& 6: 375=b \\
& \therefore \text { निब्र म० पु चीमझाना }=\frac{a \times a-2 \times a+b+b \times b}{a-b} \\
& =\frac{a^{2}-2 a b+b^{2}+c}{a-b} 02= \\
& =\frac{(a-b)^{2}}{(a+b)^{-5}} \text { जित जemt } \\
& \frac{1}{55} \frac{(a-b)(a-b)}{(a-b)} \\
& \pi\left(\frac{1}{x}-(a)-b\right) \\
& =(8.625-6.375) \\
& =2: 25 \\
& \text { Ans: 2.25, }
\end{aligned}
$$

(5) तुक्श जmin,

$$
\begin{aligned}
& a+b=7 p \\
& a b=12 p \\
& d r=(a-b)-i \\
& =(a-b)^{2}
\end{aligned}
$$

$$
\begin{aligned}
& =(8 x+6 y)^{2}+y^{2} \\
& =\left(8 \times \frac{1}{8}+6 \times 1\right)^{2}+(1)^{2} \\
& =(1+6)^{2}+1 \\
& \begin{array}{ll}
=7^{2}+1 \\
=849+1
\end{array} \quad \text { Jewel's Care Hand Note } \\
& =50 \\
& \text { Ams) } 50, \\
& \text { (4) लउअन आ (2, } \\
& x-\frac{1}{x}=a \\
& \text { प्रूं } 3 \text { दामिभानि }=x^{2}+\frac{1}{x^{2}} \\
& =\left(x-\frac{1}{x}\right)^{2}+2 \cdot x \cdot \frac{1}{x} \\
& =(a)^{2}+2 \\
& =a^{2}+2 \\
& \text { Ans: } a^{2}+2
\end{aligned}
$$

$$
\begin{aligned}
& =(a+b)^{2}-4 a b \\
& 3)^{2}(7 p)^{2}-4 \times 12 p^{2} \\
& =42 p^{2}-48 p^{2} \\
& =p^{2} \\
& \therefore(a-b)^{2}=p^{2} \\
& \text { Ir } a-b= \pm \sqrt{p^{2}} \\
& \text { To, } a-b= \pm p \\
& \text { Ans: } \pm p \\
& \text { (6) तरण्या शाए, } \\
& x-y=2 \\
& x y=3
\end{aligned}
$$

$$
\begin{aligned}
& =(x+y)^{2} \\
& =(x-y)^{2}+4 x y \\
& =(2)^{2}+4 \times 3 \\
& =4+12 \\
& =16 \\
& \therefore(x+y)^{2}=16 \\
& \text { Tri, } x+y= \pm \sqrt{16}
\end{aligned}
$$




$$
\begin{aligned}
& x+\frac{1}{x}=4 \\
& \text { or } \frac{x^{2}+1}{x}=4 \\
& \text { or. } x^{2}+1=4 x
\end{aligned}
$$

$$
\begin{aligned}
& =\frac{x}{x^{2}+1-3 x} \\
& =\frac{x}{4 x-3 x} \\
& =\frac{x}{x} \\
& =1 \\
& \text { Ans: } 1
\end{aligned}
$$

(9) परुअना आचू,

$$
\begin{gathered}
x+y=12 \\
x-y=2 \\
\text { (2n3 याभि }=x^{2}+y^{2} \\
=\frac{(x+y)^{2}+(x-y)^{2}}{2}
\end{gathered}
$$

$$
\begin{aligned}
& =\frac{12^{2}+2^{2}}{2} \\
& =\frac{144+4}{2} \\
& =\frac{148}{2} \\
& =74 . \\
& \text { भाचान゙, } \\
& 243 \operatorname{\pi n} 3 r=x y \\
& =\left(\frac{x+y}{2}\right)^{2}-\left(\frac{x-y}{2}\right)^{2} \\
& =\left(\frac{12}{2}\right)^{2}-\left(\frac{2}{2}\right)^{2} \\
& =(6)^{2}-(1)^{2} \\
& =36-1 \\
& =35 \\
& \text { Ars: } 74,35, \\
& \text { (16) तम अया ब्यादू, }
\end{aligned}
$$

$$
\begin{aligned}
& a+b=\sqrt{3} \\
& a-b=\sqrt{2} \\
\therefore \text { चाअभझS }= & 8 a b\left(a^{2}+b^{2}\right) \\
= & 8 \times\left\{\left(\frac{a+b}{2}\right)^{2}-\left(\frac{a-b}{2}\right)^{2}\right\}\left\{\frac{(a+b)^{2}+(a-b)^{2}}{2}\right\}
\end{aligned}
$$



$$
45
$$

$$
=9 \times 5
$$

$$
=\left(\frac{9+5}{2}\right)^{2}-\left(\frac{9-5}{2}\right)^{2}
$$

$$
=\left(\frac{14}{2}\right)^{2}-\left(\frac{4}{2}\right)^{2}
$$

$$
=7^{2}-2^{2}
$$

Ans: $7^{2}-2^{2}$

$$
\begin{aligned}
& =8 \times\left\{\left(\frac{\sqrt{3}}{2}\right)^{2}-\left(\frac{\sqrt{2}}{2}\right)^{2}\right\}\left\{\frac{\left.(\sqrt{3})^{2}+(\sqrt{2})^{2}\right\}}{2}\right\} \\
& \left.=8 \times\left\{\left(\frac{3}{4}-\frac{2}{4}\right)\right\}\left\{\frac{3+\frac{2}{2}}{2}\right)\right\} \\
& =8 \times\left(\frac{3-2}{4}\right) \times \frac{5}{2} \\
& =8 \times \frac{1}{4} \times \frac{5}{2} \\
& =5 . \\
& =\text { जातमझS } \\
& 88-\frac{102}{} e^{e^{1 c^{c}}}= \\
& \therefore \text { चाआयवड = बनतथेड. } \\
& \text { (संतनिण) }
\end{aligned}
$$

(12) तुन्तय बापा

$$
\begin{aligned}
& x+y+z=15 \\
& x^{2}+y^{2}+z^{2}=83
\end{aligned}
$$

tarzरा ऊरतन,

$$
\begin{aligned}
& x y+y z+z x=\frac{(x+y+z)^{2}-\left(x^{2}+y^{2}+z^{2}\right.}{2} \\
& =\frac{(15)^{2}-83}{2} \\
& \text { Hand } \mathrm{NO}=\frac{295-83}{2} \\
& =\frac{142}{2}
\end{aligned}
$$

$$
\begin{aligned}
& \text { Ans: } 71
\end{aligned}
$$

(13) चर(ुसा tyng?

$$
\begin{gathered}
x+y+z=p \\
x y+y z+z x=q \\
\therefore \text { य्यम } 3 \text { नाxण }=(x+y)^{2}+(y+z)^{2}+(z+2 x)^{2} \\
=x^{2}+2 x y+y^{2}+y^{2}+2 y z+z^{2}+z^{1}
\end{gathered}
$$

$$
\begin{aligned}
& +2 z x+x^{2} \\
= & 2 x^{2}+2 y^{2}+2 z^{2}+2 x y+2 y z+2 z x \\
= & 2\left(x^{2}+y^{2}+z^{2}\right)+2\left(x y+y z+z x_{0}\right) \\
= & 2\left\{(x+y+z)^{2}-2(x y+y z+z x)\right\}+2(x y+y z z x) \\
= & 2\left\{p^{2}-2 q\right\}+2 q \\
= & 2 p^{2}-4 q+2 q \\
= & 2 p^{2}-2 q
\end{aligned}
$$

A(x): $2 p^{2}-2 q$
(14.) तиक्या ज्या

$$
\begin{aligned}
& a+b: c=10 \\
& a^{2}+b^{2}+c^{2}=38 \\
& \therefore \text { ब्यात } 3 \text { तामि }=(a-b)^{2}+(b-c)^{2}+(c-a)^{2} \\
& =a^{2}-2 a b+b^{2}+b^{2}-2 b e+c^{2}+c^{2}-2 c a+a^{2} \\
& =2 a^{2}+2 b^{2}+2 c^{2}-2 a b-2 b c-2 c a \\
& =2\left(a^{2}+b^{2}+c^{2}\right)-2(a b+b c+c a) \\
& =2\left(a^{2}+b^{2}+c^{2}\right)-\left\{\left(a+b+c^{2}-\left(a^{2}+b^{2}+c^{2}\right)\right\}\right.
\end{aligned}
$$

$$
\begin{aligned}
& =2 \times 38-\left\{(10)^{2}-38\right\} \\
& =76-\{100-38\} \\
& =76-62 \\
& =14
\end{aligned}
$$

Ans: 14
(15.) Th(3)Tr 6arng.

$$
\therefore \text { य्तर०3 चोमन }=\frac{x(x-p)=1}{x(x-p)}
$$

$$
\begin{aligned}
& x-\frac{1}{x}=p^{1} \\
& \text { Ir. } \frac{x^{2}-1}{x}=P \\
& \text { 2r. } x^{2}-1=p x \\
& \text { Ir. } x^{2}-p x=1 \\
& \text { zi) } x(x-P)=1 \\
& \therefore x(x-p)=1 \\
& =\frac{c^{1}}{1} \\
& 16 \text { Ans C }
\end{aligned}
$$

(17) $(3 a+4 b)(5 a+2 c)$ गराय सनकस्यक

रूल्र सापयण.

$$
\begin{aligned}
& (3 a+4 b)(5 a+2 c) \\
= & \left\{\frac{(3 a+4 b)+(5 a+2 c)}{2}\right\}^{2}-\left\{\frac{(3 a+4 b)-(5 a+2 c}{2}\right\}^{2} \\
= & \left\{\frac{3 a+4 b+5 a+2 c}{2}\right\}^{2}-\left\{\frac{3 a+4 b-5 a-2 c^{2}}{2}\right\}^{2} \\
= & \left\{\frac{8 a+4 b+2 c}{2}\right\}^{2}-\left\{\frac{4 b-2 a-2 c}{2}\right\}^{2} \\
= & \left\{\frac{2(4 a+2 b+c)}{2}\right\}^{2}-\left\{\frac{2(2 b-a-c}{2}\right\}^{2} \\
= & (4 a+2 b+c)^{2}-(2 b-a-c)^{2} \\
& \text { Ans! }(4 a+2 b+c)^{2}-(2 b-a-c)^{2}
\end{aligned}
$$


(19) M(3 ar form ?

$$
\begin{aligned}
& x=\sqrt{3}+\sqrt{2} \\
& \text { th, } \frac{1}{x}=\frac{1}{\sqrt{3}+\sqrt{2}} \\
& \text { tr, } \frac{1}{x}=\frac{1 \times(\sqrt{3}-\sqrt{2})}{(\sqrt{3}+\sqrt{2})(\sqrt{3}-\sqrt{2})} \\
& \text { Fr. } \frac{1}{x}=\frac{\sqrt{3}-\sqrt{2}}{(\sqrt{3})^{2}-(\sqrt{2})^{2}} \\
& \operatorname{tr} \frac{1}{x}=\frac{\sqrt{3}-\sqrt{2}}{3-2} \\
& \operatorname{tr}, \frac{1}{x}=\frac{\sqrt{3}-\sqrt{2}}{1} \\
& \therefore \frac{1}{x}=\sqrt{3}-\sqrt{2} \\
& \therefore \text { बताप सीकण }=x^{2}+\frac{1}{x^{2}} \\
& =(\sqrt{3}+\sqrt{2})^{2}+(\sqrt{3}-\sqrt{2})^{2} \\
& =(\sqrt{3})^{2}+2 \cdot \sqrt{3} \cdot \sqrt{2}+(\sqrt{2})^{2}+ \\
& (\sqrt{3})^{2}-2 \cdot \sqrt{3} \cdot \sqrt{2}+(\sqrt{2})^{2} \\
& =3+2+3+20= \\
& =10 \text { Ans } 10
\end{aligned}
$$

$$
\begin{aligned}
& \text { (20) लन्तन्त ज्ञाते } \\
& x=b-c \\
& y=c-a \\
& z=a-b \\
& \therefore \text { जमतु उnar }=x^{2}-y^{2}+z^{2}+2 x z \\
& =x^{2}+2 x z+z^{2}-y^{2} \\
& =(x+z)^{2}-y^{2} \\
& =(x+z+y)(x+z-y) \\
& =(b-c+a-b+c-a)(b-c+a-b *+a) \\
& =0 \times(2 a-2 c) \\
& =0 \\
& \text { विदलल } x^{2}-y^{2}+z^{2}+2 x z \\
& =(b-c)^{2}-(c-a)^{2}+(a-b)^{2}+2(b-c)(a-b)
\end{aligned}
$$

$$
\begin{aligned}
& =b^{2}-2 b c+c^{2}+c^{2}+2 c^{2}+a^{2}+a^{2}+2 a b+b^{2} \\
& -2 a b-2 c a-2 b^{2}+2 b c \\
& =0 \\
& \text { (2i) } x^{2}+8 x-20 \\
& =(2)^{2}+2 \cdot x \cdot 4+(4)^{2}-16-20 \\
& =(x+4)^{2}-36 \\
& \left.=(x+4)^{2}-(6)^{2} \underline{\underline{12}}\left[\nabla^{2}(6)^{2}\right)^{2}\right] \\
& =(x+4+6)(x+4-6)
\end{aligned}
$$

$$
\begin{aligned}
& \text { fing GTt: }
\end{aligned}
$$

Extra

$$
\begin{aligned}
& \text { (1) }(a+b)^{6}-(a-b)^{6}-12 a b\left(a^{2}-b^{2}\right)^{2}+d= \\
& =\left\{(a+b)^{2}\right\}^{3}-\left\{(a-b)^{2}\right\}^{3}-3 \cdot(a+b)^{2} \cdot(a-b)^{2} \\
& \left\{(a+b)^{2}-(a-b)^{2}\right\}\left[\begin{array}{l}
\text { अनr (a) } 2, \\
(a+b)^{2}-(a-b)^{2} \\
=4 a b
\end{array}\right] \\
& =\left\{(a+b)^{2}-(a-b)^{2}\right\}^{3} \\
& =\left\{a^{2}+2 a b+b^{2}-a^{2}+2 a b-b^{2}\right\}^{3} \\
& =\{4 a b\}^{3} \\
& \text { F. } 64 a^{3} b^{3}
\end{aligned}
$$

(2) $a+b=6, a b=6$ शल (M2n'3 $2 r, a^{3}-b^{3}=$ ?


$$
\begin{aligned}
& a+b=6 \\
& a b=6
\end{aligned}
$$

- थाअकर ऊनि.

$$
\begin{aligned}
(a-b)^{2} & =(a+b)^{2}-4 a b \\
\operatorname{tr}(a-b)^{2} & =(6)^{2}-4 \times 6
\end{aligned}
$$

$$
\begin{aligned}
& \text { ar) } \left.(a-b)^{4}\right) \quad 36+240 x=01=\frac{1}{5 x}+3 x(8)
\end{aligned}
$$

$$
\begin{aligned}
& \text { 7. }(a-b)=\sqrt{12} \text {-1. } \\
& \text { In }(a-b)=\sqrt{3 \times 4}-\left(\frac{a}{x}+x c\right) \\
& \text { 7r. } a-b=2 \sqrt{3} \text { (1) } 51500^{20} \\
& \text { जगतन. } \\
& a^{2} b^{6}=(a-b)^{3}+3 a b\left(a^{2}-b\right) \\
& =(2 \sqrt{3})^{3}+3 \times 6 \times 2 \sqrt{3} \\
& =8(\sqrt{3})^{3}+38 \sqrt{3} \\
& =8 \times 3 \times \sqrt{3}+36 \sqrt{3} \text { (1) } \\
& \text { of } \\
& =60 \sqrt{3} r^{-r} \\
& \therefore a^{5} b^{b}=6 a \sqrt{3} \text {. } \\
& \text { (ii). Sve (showed) रू० }
\end{aligned}
$$

(3) $x^{2}+\frac{1}{x^{2}}=10$ रल, churn] 3 cr, $x=\sqrt{3}+\sqrt{2}$


$$
\begin{aligned}
& x^{2}+\frac{1}{x^{2}}=10 \\
& \text { Fr. }\left(x+\frac{1}{x}\right)^{2}-2 \cdot x \cdot \frac{1}{x}=10 \\
& \text { Fr }\left(x+\frac{1}{x}\right)^{2}=12
\end{aligned}
$$

$$
\begin{aligned}
& \text { in } x+\frac{1}{x}=\sqrt{4 \times 3} \\
& \text { tm } x+\frac{1}{x}=2 \sqrt{3} \ldots \text { (1) }
\end{aligned}
$$

जातात?

$$
\begin{align*}
& x^{2}+\frac{1}{x^{2}}=10 \\
& \text { Ir. }\left(x-\frac{1}{x}\right)^{2}+2 \cdot x \cdot \frac{1}{x}=10 \\
& \text { In, }\left(x-\frac{1}{x}\right)^{2}=8 \\
& \text { Int } x-\frac{1}{x}=\sqrt{8} \\
& \text { In } x-\frac{1}{x}=2 \sqrt{2} \ldots \tag{II}
\end{align*}
$$

बनलन,
अभीmor (1) 3 (11) (थाडr mer.

$$
\begin{aligned}
& x+\frac{1}{x}=2 \sqrt{3} \\
& x-\frac{1}{x}=2 \sqrt{2} \\
& 2 x=2 \sqrt{3}+2 \sqrt{2} \\
& \operatorname{tr}, 2 x=2(\sqrt{3}+\sqrt{2}) \\
& 2 \pi x=\sqrt{3}+\sqrt{2} \\
& \text { (घअवविण), }
\end{aligned}
$$

(21) $x^{2}-\sqrt{2} x+1=0$ 2/ल, (42N(3) Rr, $x^{2}+\frac{1}{x^{2}}=0$.

अमार्बवः -7 (32n $\cos / 22$ ?

$$
\begin{gathered}
x^{2}-\sqrt{2} x+1=0 \\
\text { In } x(x-\sqrt{2})=-1 \\
\text { Ir, } x-\sqrt{2}=-\frac{1}{x} \\
\operatorname{Hr}, x+\frac{1}{x}=\sqrt{2} \\
\therefore x^{2}+\frac{1}{x} x=\left(x+\frac{1}{x}\right)^{2}-2 \cdot x \cdot \frac{1}{x}
\end{gathered}
$$

$$
\begin{aligned}
& =(\sqrt{2})^{2}-2 \\
& =2-2 \\
& =0 \\
& \therefore x^{2}+\frac{1}{x^{2}}=0
\end{aligned}
$$

(घる円वि)
(5) $P^{4}=119^{2}-\frac{1}{p 4}$ 2 (ल), vỉnत $\operatorname{zar}\left(2 r, P=3+\frac{1}{p}\right.$


$$
\begin{aligned}
& p^{4}=119-\frac{1}{p 4} \\
& \text { ar, } p^{4}+\frac{1}{p^{4}}=119 \\
& \text { or, }\left(p^{2}\right)^{2}+\left(\frac{1}{p^{2}}\right)^{2}=119 \\
& \text { तr, }\left(p^{2}+\frac{1}{p^{2}}\right)^{2}-2 \cdot p^{2} \cdot \frac{1}{p^{2}}=119 \\
& \text { (r, }\left(p^{2}+\frac{1}{p^{2}}\right)^{2}=119+2 \\
& \text { थn, } p^{2}+\frac{1}{p^{2}}=-\sqrt{121} \\
& \text { (t) }\left(p+\frac{1}{p}\right)^{2}+2 \cdot p \cdot \frac{1}{p}=11
\end{aligned}
$$

$$
\begin{aligned}
& \text { Tr. }\left(p-\frac{p}{P}\right)^{2}=11-2 \\
& \text { सr, }\left(P-\frac{1}{p}\right)^{2}=9 \\
& \text { सr, } P-\frac{1}{p}=\sqrt{9} \\
& \text { 2r, } P-\frac{1}{p}=3 \\
& \operatorname{tr}, p=3+\frac{1}{p} \\
& \text { (ब3nतण) }
\end{aligned}
$$

$$
5
$$

$$
\text { शल, घअन गयु }\left(2 r, x+\frac{1}{4}=2\right.
$$

अर्यारातः

$$
\begin{aligned}
& x^{4}+\frac{1}{x^{4}}=2 \\
& \text { तr, }\left(x^{2}\right)^{2}+\left(\frac{1}{x^{2}}\right)^{2}=2 \\
& \text {-rr, }\left(x^{2}+\frac{1}{x^{2}}\right)^{2}-2 x^{2}-\frac{1}{x^{2}}=-2 \\
& \text { कr, }\left(x^{2}+\frac{1}{x^{2}}\right)^{2}-2=2 \\
& \text { (x, }\left(x^{2}+\frac{1}{x^{2}}\right)^{2}=4 \\
& \text { or, } x^{2}+\frac{1}{x^{2}}=\sqrt{4}
\end{aligned}
$$

$$
\begin{aligned}
& 6+1+2+3 \\
& \therefore\left(\frac{1}{5}+2\right)^{2} \\
& 31-20.20
\end{aligned}
$$

$$
\text { Tr, }\left(x+\frac{1}{x}\right)^{2}-2 \cdot x \cdot \frac{1}{x}=2
$$

Fr. $\left(x+\frac{1}{x}\right)^{2}=4$
(ax $x+\frac{1}{x}=\sqrt{9}$

- $x+\frac{1}{x}=$ ?


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

( 격№)
(7) $x^{4}+\frac{1}{x^{4}}=02\left(\mathrm{~m},\left(4^{2}\right) \operatorname{rr}^{3}\left(2 r \cdot x+\frac{1}{x}=2 x^{2}\left(x_{1}\right)\right.\right.$ उकांधव:

$$
\begin{aligned}
& x^{2}+\frac{1}{x^{2}}=0 \\
& \pi_{1}\left(x^{2}\right)^{2}+\left(\frac{1}{x^{2}}\right)^{2}=0 \\
& \text { ar, }\left(x^{2}+\frac{1}{x^{2}}\right)^{2}-2 \cdot x^{2} \cdot \frac{1}{x^{2}}=0 \\
& \text { Ir, }\left(x^{2}+\frac{1}{x^{2}}\right)^{2}-2=0 \\
& \pi_{1}\left(x^{2}+\frac{1}{x^{2}}\right)^{2}=2 \\
& \text { Ir. }\left(x^{2}+\frac{1}{x^{2}}\right)=\sqrt{2} \\
& 90
\end{aligned}
$$

$$
\begin{aligned}
& \text { a) }\left(x+\frac{1}{x}\right)^{2}-2 \cdot x \cdot \frac{1}{x}=\sqrt{2} \\
& \text { Tr }\left(x+\frac{1}{x}\right)^{2}-2=\sqrt{2} \\
& \text { Tr, }\left(x+\frac{1}{2}\right)^{2}=\sqrt{2}+2 \\
& \text { هr, }\left(x+\frac{1}{x}\right)^{2}=\sqrt{2+}+\sqrt{2} \times \sqrt{2} \\
& \text { त, }\left(x+\frac{1}{x}\right)^{2}=\sqrt{2}(1+\sqrt{2}) \\
& -\left(\sqrt{2} x+\frac{1}{x}=\sqrt{\sqrt{2}(1+\sqrt{2})}\right. \\
& \text { (ब) } x+\frac{1}{x}=2 \sqrt{(1+\sqrt{2} x)} \\
& \text { (Showed) } \\
& \text { 3.1-ज्वुणचीनीव ऊयानय }
\end{aligned}
$$

(10) $x-\frac{6}{x}=1$ शल, $\frac{6}{x^{2}+x+1 \text { (ब० मुत? }}$


$$
\begin{aligned}
& x-\frac{6}{x}=1 \\
& \sin \frac{x^{2}-6}{x}=1
\end{aligned}
$$

$$
\begin{aligned}
& \text { [7. } x^{2}-6=x \\
& \text { Tr. } x^{2}-x-6=0 \\
& \text { ta } x^{2}-3 x+2 x-6=0 \\
& \text { Fr, } x(x-3)+2(x-3)=0 \\
& \text { or }(x-3)(x+2)=0 \\
& \therefore 225 \\
& \text { जथनr, } \\
& x-3=0 \text {. } \\
& x+2=0 \\
& \text { - } 6 x=3 \\
& \text { or, } x=-2 \\
& \therefore x=3 \text { gाल, } \frac{6}{x^{2}+x+1}=\frac{6}{3^{2}+3+1} \\
& =\frac{6}{9 \pm 3+1} \\
& \begin{aligned}
\therefore x=-2 \text { शल, } \frac{6}{x^{2}+x+1} & =\frac{6}{\frac{6}{3}} \\
& =\frac{6}{4-2+1}
\end{aligned}
\end{aligned}
$$

$$
\begin{aligned}
= & \frac{6}{3} \\
= & 2 \\
\therefore \quad & \frac{6}{x^{2}+x+1}=13-3 m=\frac{6}{13}, 2121
\end{aligned}
$$

（41）$x-y=1$ दबण०，$x y=56$ 2（ल，$x+y=$ ？
a अzn⿱⿰㇒一十凵a：

$$
\begin{aligned}
\text { (2)TB तraor } & =x+y \\
& =\sqrt{(x+y)^{2}} \\
& =\sqrt{(x+y)^{2}+9 x y} \\
& =\sqrt{(1)^{2}+4 \times 56} \\
& =\sqrt{1+2124} \\
& =\sqrt{295} \\
\text { Han } 10 & = \pm 15 \\
\therefore x+y & = \pm 15121
\end{aligned}
$$

(5) ruter ar ancz:

$$
\begin{aligned}
& a+b=7 P \\
& a b=12 P^{2}
\end{aligned}
$$

वशतन

$$
\begin{aligned}
& a-b \\
= & \sqrt{(a-b)^{2}} \quad \text { Jed } \\
= & \sqrt{(a+b)^{2}-4 a b} \\
= & \sqrt{(7 p)^{2}-4 \times 12 p^{2}} \\
= & \sqrt{49 p^{2}-48 p^{2}} \\
= & \sqrt{p^{2}} \\
& = \pm p \\
\therefore & a-b= \pm p R 1
\end{aligned}
$$



$$
\begin{aligned}
& x-y=2 \\
& x y=3
\end{aligned}
$$

CoPra,

$$
\begin{aligned}
& x+y \\
= & \sqrt{(x+y)^{2}} \\
= & \sqrt{(x+y)^{2}+4 x y} \\
= & \sqrt{2^{2}+4 \cdot 3} \\
= & \sqrt{4+18} \\
= & \sqrt{16} \\
= & \sqrt{4^{2}} \\
= & \pm 4 \\
\therefore & x+y= \pm 4 e^{0}
\end{aligned}
$$

*** देभाजांबर
(1) $\rightarrow$ "बम्नब" बूती यास किवन तr हुकर्पी बत्य या Fित्र.
 2m. निनि
(3) $\rightarrow$ "midale form" bnealx up nar an frarr
 निनित (calmast $\rightarrow 3.6$ encuras)
 sense canto 2(ल Igmm in चक्ये rnom

 Jewel's Care Hand Note

$$
\begin{aligned}
& \text { (7) }\left(a^{2}-b^{2}\right)\left(x^{2}-y^{2}\right)+4 a b x y \\
& =a^{2} x^{2}-a^{2} y^{2}-b^{2} x^{2}+b^{2} y^{2}+4 a b x y \\
& =a^{2} x^{2}+b^{2} y^{2}-a^{2} y^{2} a b^{2} x^{2}+4 a b x y \\
& =a^{2} x^{2}+2 a x \cdot b y+b^{2} y^{2}-a^{2} y^{2}+2 a y \cdot b x \\
& \left.\left.=(a x)^{2}+2 a x b y+b y\right)^{2}-\left\{(a y)^{2}-2 a y b x+b x\right)^{2}\right\} \\
& \left.=(a x+b y)^{2}-a(a y-b x)^{2}\right\} \\
& =(a x+b y+a y-b x)(a x+b y-a y+b x) A m x
\end{aligned}
$$





$$
\text { (10) } \begin{aligned}
& a^{4}+4 \\
& =\left(a^{2}\right)^{2}+(2)^{2} \\
& =\left(a^{2}+2\right)^{2}-2 a^{2} \\
& =\left(a^{2}+2\right)^{2}-4 a^{2} \\
& =\left(a^{2}+2\right)^{2}-(2 a)^{2} \quad 3 e^{1+1} \\
& =\left(a^{2}+2+2 a\right)\left(a^{2}+2-2 a\right) \text { Ans }
\end{aligned}
$$




$$
\begin{aligned}
& \text { (17) } \begin{array}{l}
a^{2}-1+2 b-b^{2} \\
\Rightarrow \\
a^{2}-\left(b^{2}-2 b+1\right) \\
=a^{2}-(b-1)^{2} \\
=(a+b-1)(a-b+1) \text { has: }
\end{array} \text { (a-b)}
\end{aligned}
$$


(21)

$$
2 x^{3}+3 x^{2}+3 x+x^{2}(d-0)+(8 d+00+9(d x)=
$$

$$
=(x)^{3}+3 \cdot x^{2}+1+3 x \cdot 1+(1)^{3}+1
$$

$$
\left.=(x+1)^{3}+1+d a c+d+d x^{\prime} 0\right)(d-0)=
$$

$$
=(x+1)^{3}+(1)^{3}
$$

$$
\begin{aligned}
& =(x+1)+1 \\
& =(x+1+1)\left\{(x+1)^{2}-1(x+1)+1^{x}\right\}
\end{aligned}
$$

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

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

$$
\begin{aligned}
& =(x+2)\left(x^{2}+2 x+1-x-\left(x^{2}+x+1\right)+(x+2)\left(x^{2} e^{(x)}\right.\right. \\
& x=a^{3}-9 b^{3}-(a+b)^{3}, e^{0} \\
& =a^{3}-b^{3}+(a+b)^{3}-8 b^{3} \\
& \left.=(a-b)\left(a^{2}+a b+b^{2}\right)+\{(a+b))^{3}-(2 b)^{3}\right\} \\
& =(a-b)\left(a^{2}+a b+b^{2}\right)+(a+b-2 b) \\
& \left.=\{(a+b))^{2}+2 b(a+b)+(2 b)^{2}\right\}
\end{aligned}
$$

$$
\begin{aligned}
& =(a-b)\left(a^{2}+a b+b^{2}\right)+(a-b)\left(a^{2}+2 a b+b^{2}+2 a b+2 b\right) \\
& =(a-b)\left(a^{2}+a b+b^{2}+a^{2}+2 a b+b^{2}+2 a b+2 b^{2}+4 b^{2}\right) \\
& =(a-b) \cdot\left(2 a^{2}+5 a b+8 b^{2}\right) \text { Ans: }
\end{aligned}
$$

In fard: $a^{3}-9 b^{3}+(a-b)^{3}$

$$
\begin{aligned}
& =a^{3}-8 b^{3}+(a-b)^{3}-b^{3} \text { jewels care }{ }^{\text {Hand }} \\
& =(a)^{3}-(2 b)^{3}+\left((a-b)^{3}-(b)^{3}\right. \\
& =(a-2 b)\left\{a^{2}+2 b-a+(2 b)^{2}\right\}+(a-b-b) x \\
& x\left\{(a-b)^{2}+b(a-b)+b^{2}\right\} \\
& =(a-2 b)\left(a^{2}+2 a b+4 b^{2}\right)+(a-2 b)= \\
& x\left(a^{2}-2 a b+b^{2}+a b-b^{2}+b^{2}\right) \\
& =(a-2 b)\left(a^{2}+2 a b+4 b^{2}+a^{2}-a b+b^{2}+a b-b^{2}+b^{2}\right)
\end{aligned}
$$

(24) $m^{3}-n^{3}-m\left(m^{2}-n^{2} i\right)+n(m-x)^{2}$ $=(m-n)\left(m^{n}+m n+n^{n}\right)-m(m+n)(m-n)+n(m+n)(m-n)$

$$
\begin{aligned}
& =(m-n)\left(m^{2}+m n+1\right) \\
& =(m-n)\left(m^{2}+m n^{n}+n^{2}-m m^{2}-m n+m n+n^{n}\right)
\end{aligned}
$$

$$
=(m-n) m n \text { Ans: }
$$

(25) dy $+a-y^{2}-2 y+1$

$$
\begin{aligned}
& \text { 255 oy } \left.+a-2 y+a-\left(y^{2}+2 y+1\right)\right\} \\
& \left.=a y+(y+1)^{2}+0\right)-(y+1) \\
& =a(y+1)-(y+1)-(y+1)) \\
& (1=a(1)
\end{aligned}
$$

$$
\begin{align*}
& * a^{3}-2 b^{3}+(a+b)^{3}  \tag{38}\\
& * a^{3}-9 b^{3}+(a-b)^{3}-14 \\
& \begin{array}{r}
* a^{3}-9 b+(a-)^{2} \\
*(a+b)^{3}-2\left(-4 b^{3}\right. \\
*-8 b^{3} m^{3} \sim b^{3}
\end{array} \\
& \text { *(a+b)3-2न み2r-b } 8 b^{3} \text { a } \\
& * a^{3}-2 b^{3} t(a+b)^{3}-1 A \\
& \int(5, i) A=
\end{align*}
$$

$$
\begin{align*}
& =(a-2 b)\left(2 a^{2}+a b+5 b^{2}\right) \text { Ans: } \tag{1+y}
\end{align*}
$$

$$
=(y+1)(a-y-1)
$$

$$
\text { (28) } \begin{aligned}
& A R^{3}-A r^{3}+A R^{2} h-A r^{2} h \\
&=A\left(R^{3} r^{3}\right)+A h\left(R^{2}-r^{2}\right) \\
&=A(R-r)\left(R^{2}+R n+n^{2}\right)+A h(R+r)(R-r) \\
&=A(R-r)\left\{\left(R^{2}+R n+r^{2}\right)+h(R+r)\right\} \\
&=A(R-r)\left(R^{2}+R n+r^{2}+h R+h r\right) A
\end{aligned}
$$

(20) $x^{2}+3 x-a^{2}-a+2$

$$
\begin{aligned}
& =x^{2}+3 x-\left(a^{2}+a-2\right) \\
& =x^{2}+3 x-\left(a^{2}+2 a-a-2\right) \\
& =x^{2}+3 x-\{a(a+2)-1(a+2)\} \\
& =x^{2}+3 x-(a+2)(a-b) \\
& =x^{2}+(a+2) x-(a-1) x-(a+2)(a-1)
\end{aligned}
$$

$$
\begin{aligned}
& =x(x+a+2) \rightarrow(a-1)(x+a+2) . \\
& =(x+a+3)(x-a+1) \text { An) }
\end{aligned}
$$


 $(3.4 \rightarrow 16.19$ जिए द्रका: 20) =0.

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

$$
=a(a-4)+4\left[x^{2}+3 x=a \text { री } 2\right]
$$

$$
\begin{aligned}
& =a^{2}-4 a+4 \\
& =a^{2}-2 \cdot a \cdot 2+2^{2}
\end{aligned}
$$

$$
=(a-2)^{2}
$$


 (voyy 2 mi$)$

$$
\begin{aligned}
& \text { (311 } 16 x^{2}-25 y^{2}-8 x z+10 y z \\
& =(4 x)^{2}-(5 y)^{2}-2 z(4 x+5 y) \\
& =(4 x+5 y)(4 x-5 y)-2 z(4 x+5 y) \\
& =(4 x+5 y)(4 x-5 y-2 z) \text { Ans }
\end{aligned}
$$

$$
\begin{aligned}
& =\left(x^{2}+3 x-e\right)^{2}[a=60 \text { 万nब तौn } n x] \\
& =\left(x^{2}+3 x+8\right)\left(x^{2}+3 x-2\right) \text { Ans: }
\end{aligned}
$$

$$
\text { (33) } \begin{aligned}
& \frac{1}{2} m(v+2 u)^{2}+\frac{1}{2} m(v+u)^{2} \\
= & \frac{m}{2}(v+2 u)^{2}+\frac{m}{2}(v+u)^{2} \\
= & \frac{m}{2}\left\{(v+2 u)^{2}-(v+u)^{2}\right\} \\
= & \frac{m}{2}(v+2 u+u+u)(v+2 u-x-u) \\
= & \frac{m}{2}(2 v+3 u) u \\
= & \frac{m u}{2}(2 v+3 u)+A n s:
\end{aligned}
$$

$$
\begin{aligned}
& \text { (15.) } y^{2}-2 a y+(a+b)(a-b) \\
& =y^{2}-2 a y+a^{2}-b^{2} \\
& =(y-a)^{2}+b^{2}-(y-a-b) \text { Ansels: }
\end{aligned}
$$

$$
\begin{aligned}
& \text { (20) } x^{4}+3 x^{3}-5 x^{2}-15 x \\
& =x\left(x^{3}+3 x^{2}-5 x-15 x\right) \\
& =x\left\{x^{2}(x+3)-5(x+3)\right\} \\
& =x(x+3)\left(x^{2}-5\right) \text { Ans: }
\end{aligned}
$$

$$
\text { (4) } 5(x+y)^{2}+18\left(x^{2}-y^{2}\right)-8(x-y)^{2}-\frac{3 \cdot 50^{215}}{10^{2}}
$$

$$
=5(x+y)^{2}+18(x+y)(x-y)-8(x-y)^{2}
$$

$$
=5 a^{2}+18 a b-8 b^{2}[x+y=a, y-y=b]
$$

$$
=5 a^{2}+20 a b-2 a b-8 b^{2}
$$

$$
=5 a(a+4 b)-2 b(a+4 b)
$$

$$
=(a+4 b)(5 a-2 b)
$$

$$
\begin{aligned}
& =\{x+y+4(x-y)\}\{5(x+y)-2(x y)] \\
& =\{x+y(-4 x-4 y) \cdot(5 x+5 y-2 x+2 y) \\
& =(5 x-3 y)(3 x+7 y) \text { Ins: }
\end{aligned}
$$

$$
\text { (5) }(a+b) x^{2}-2 a x+(a-b)
$$

अभाधीबः
डकीन यमि,

$$
\begin{align*}
& a+b=m \\
& a-b=n \tag{ii}
\end{align*}
$$

$$
\begin{aligned}
& \text { अभीकणनि (i) (3 (ii) , 2ms mar, } \\
& a+b=m \\
& a-y=n \\
& \text { 2a. }=m+n \\
& \therefore \text { - } n \text { त्वx }=m x^{2}-(m+n) x+n \\
& =m x^{3}+m x-n x+n \\
& =m x(x-1)-n(x-1)
\end{aligned}
$$

$$
\begin{aligned}
& =(x-1)(m x-n) \\
& =(x-1)\{(a+b) x-(a-b)\} \\
& =(x-1)(a x+b x-a+b) \text { Ans: }
\end{aligned}
$$


 पद्य धिं, $(a+b)=m ;(a-b)=n \quad$ द्यAत zont onisu uns- founro 3nogar $2 a$ $=m+n$ moyr un.
(6) $(a-1) x^{2}+a^{2} x y+(a+1) y^{2}$ उसमएँब०

$$
\begin{align*}
& \text { उत्र त्रा } \\
& \qquad a+1=m  \tag{i}\\
& a-n=n
\end{align*}
$$

$x+\rho(x+\infty) a-m=n \quad$ (ii)


$$
\begin{aligned}
& a+r=m \\
& a-1=n \\
& \overline{(a+1)}(a-1)=m n \\
& \text { zig } a^{2}-1 \cdot=m n \\
& \text { (11) } a^{2}=m n+1 \\
& \therefore \text { Qnt } 2 \text { 2ror }=n x^{2}-(m n+1) x y+ \\
& \text { myz } \\
& =n x^{2}+m n y y+x y+m y^{2} \\
& 0^{0^{2}}=n x(x+n y)+y(x+m y) \\
& x^{0}(0)=(x+x y)(n x+y) \\
& =\{x+(a+1) y\}\{(a-1) x+y\} \\
& =(x+a y+y)(a x-x+y) \\
& \text { Ans: }
\end{aligned}
$$

(10) $(a-m) x^{2}-(x-a) x y+(m-x) y^{2}$ उसमांव:

$$
\begin{array}{r}
\text { उnत लवि, } \\
a-m=p  \tag{i}\\
m-x=q
\end{array}
$$

$$
a-m=p \cdots(i)
$$



$$
\begin{gathered}
a-m=p \\
m-x=q \\
a-x-p+q \\
\text { (rrot }(x-a)=p+q \\
\text { tro } x-a=-(p+q)[(-1) \text { mprigac }]
\end{gathered}
$$

$\therefore$ ロLT3 -rfor $=p x^{2}-\{-(p+q)\} x y+q y^{2}$

$$
=p x^{2}+(p+q) x y+q y^{2}
$$

$$
=p x^{2}+p x y+q x y+q y^{2}
$$

$$
=p x(x+y)+q y(x+y)
$$

$$
\begin{aligned}
& =(x+y)(p x+q y) \\
& =(x+y)\{(a-m) x+(m-x) y\} \\
& =(x+y)(a x-m x+m y-x y) \text { Ans: } \\
& \text { (11) } \frac{1}{2} p^{2}-3 p+4 \\
& =\frac{1}{2}\left(p^{2}-6 p+8\right) \\
& =\frac{1}{2}\left(p^{2}-4 p-2 p+8\right) \\
& =\frac{1}{2}\{P(P-4)-2(P-4)\} \\
& =\frac{1}{2}(P-4)(P-2) \underline{\text { Ans: }}
\end{aligned}
$$

$$
\begin{aligned}
& \text { अ23r ens onल } \frac{3}{\frac{1}{2}}=3 \times \frac{2}{1}=6 \text {; } \\
& \text { (aro, } \frac{1}{2} \text { जिए } 4 \text { (क) कार निएब }=\frac{\frac{4}{\frac{1}{2}}}{\frac{2}{2}} \\
& =4 \times \frac{2}{1}=8 \text { 2v, कमे }
\end{aligned}
$$



$$
\begin{aligned}
& =(a+1)\{a(a-5)+4(a-5)\} \\
& =(a+1)(a-5)(a+4) \text { Ans }
\end{aligned}
$$

(2) अत सीवा?

$$
\begin{aligned}
& f(x)=x^{3}+6 x^{2}+11 x+6 \\
& \begin{aligned}
f(-1) & =(-1)^{3}+6(-1)^{2}+11(-1)+6 \\
& =-1+6-11+6 \\
& =-12+12 \\
& =0
\end{aligned}
\end{aligned}
$$


-DNa,

$$
x^{3}+6 x^{2}+11 x=+6
$$

$$
=x^{3}+x^{2}+5 x^{2}+5 x+6 x+6
$$

$$
\Rightarrow x^{2}(x+1)+5 x(x+1)+6(x+1)
$$

$$
=(x+1) \frac{\left(x^{2}+5 x+6\right)}{025}
$$

$$
\begin{aligned}
& =(x+1)\left\{x^{2}+2 x+3 x+6\right\} \\
& =(x+1)\{x(x+2)+3(x+2)\} \\
& =(x+1)(x+2)(x+3) \underline{2}
\end{aligned}
$$

(5) इत्ब लद

$$
\begin{aligned}
& f(a)=a^{4}-4 a+3 \\
& f(1)=(1)^{4}-4 \times 1+3 \\
& =1-4+3 \\
& \text { - } 4-4 \\
& =0
\end{aligned}
$$

$$
\begin{aligned}
& \text { (-2) वक } \\
& a^{4}-4 a+3 \quad r= \\
& =a^{4}-a^{3}+a^{3}-a^{2}+a^{2}-a-3 a+3 \\
& =a^{3}(a-1)+a^{2}(a-1)+a(a-1)-3(a-1)
\end{aligned}
$$

$$
\begin{aligned}
& =(a-1)\left(a^{3}+a^{2}+a-3\right) \text { जhache: } \therefore \\
& \text { - - } \\
& g(a)=a^{3}+a^{2}+a-3 \\
& \therefore g(1)=(1)^{3}+(1)^{2}+1-3 \\
& =1+1+1-3 \\
& 23-3 \\
& \%
\end{aligned}
$$

(D)N゙っ


$$
\begin{aligned}
& (a-1)(a-1)\left(a^{2}+2 a+3\right) \\
& =(a-1)^{2}\left(a^{2}+2 a+3\right) \text { Ans: }
\end{aligned}
$$

(9) 万nब बनक

$$
\begin{aligned}
& f(x)=x^{3}+6 x^{2} y+11 x y^{2}+6 y^{3} \\
& \therefore f(-y)=(-y)^{3}+6(-y)^{2} y+11(-y)^{2} y^{2}+6 y^{3} \\
& =-y^{3}+6 y^{3}-11 y^{3}+6 y^{3} \\
& =-12 y^{3}+12 y^{3} \text { Alme } \\
& =0
\end{aligned}
$$

$$
\begin{aligned}
& \text { Sिकmix. } \\
& \text { क्यकज }
\end{aligned}
$$




* \# $a^{2}+a+-1$ mos moqneand $a^{2}$ \#\# $a^{6}+a^{3} t \cdots$ \#\#\#+ $a^{10}+\cos ^{5}+15$.




 Tr2ल middle term brealx up $\rightarrow$ nceorsbul
 \#\# $a^{3+3}=a^{6} u$ \#\#\# $a^{5+5}=a^{10}$

$$
\begin{aligned}
& \text { (1) } x^{2}+x, x^{2}+2 x+1 \\
& \text { วअ बाffor } x^{2}+x \\
& =x(x+1) \\
& \text { 221 } \triangle m \text { ror }=x^{2}+2 n+1 \\
& =(x)^{2}+2 \cdot x \cdot 1+(1)^{2} \\
& =(x+1)^{2} \\
& =(x+1)(x+1) \\
& \therefore \text { बिबे sr, } 3 n, 53=(x+1)
\end{aligned}
$$

(2)

$$
\begin{aligned}
& a^{3}-b^{3}, a^{3}+b^{3} \\
& \begin{aligned}
2 \text { 31 } & =a^{3}-b^{3} \\
& =(a-b)\left(a^{2}+a b+b^{2}\right) \\
\text { 2य andor } & =a^{3}+b^{3} \\
& =(a+b)\left(a^{2}-a b+b^{2}\right)
\end{aligned}
\end{aligned}
$$

$$
\begin{aligned}
& \therefore \text { निबच } 5 T, 3 r, S 3=1 \\
& \text { (3) } a^{2}-b^{2}-c^{2}-2 b c, b^{2}-c^{2}-a^{2}-2 c a, c^{2} a^{2}-b^{2}-c a b \\
& \text { Jु } \operatorname{TM}\left\{a r=a^{2}-b^{2}-c^{2}-2 b c\right. \\
& =a^{2}-\left(b^{2}+2 b c+c^{2}\right) \\
& =a^{2}-(b+c)^{2} \\
& =(a+b+c) \cdot(a-b-c) \\
& \text { zu } \rightarrow \text { moor }=b^{2}-c^{2}-a^{2}-2 c a \\
& =b^{2}-\left(c^{2}+2 c a+a^{2}\right) \\
& =b^{2}-(c+a)^{2} \\
& =(b+c+a)(b-c-a) \\
& =(a+b+c)(b-c \pm a) \\
& \text { Gथr सnor }=c^{2}-a^{2}-b^{2}-2 a b \\
& =e^{2}-\left(a^{2}+b^{2}+2 a b\right)
\end{aligned}
$$

$$
\begin{aligned}
& =c^{2}-(a+b)^{2} \\
& =(c+a+b)(c-a-b) \\
& =(a+b+c)(c-a-b) \\
& \therefore \text { निबंध्रु, } 3 \text { m, S3 }=(a+b+c) \\
& \text { (41) } x^{2}-11 x+30, x^{3}-4 x^{2}-2 x-15 \\
& \text { วअ } \text { सnfor }=x^{2}-11 x+30 \\
& =x^{2}-6 x-5 x+30 \\
& =x(x-6)-5(x-6) \\
& =(x-6)(x-5) \\
& \text { गx) } 24 \text { anfor }=x^{3}-4 x^{2}-2 x-15 \\
& =x^{3}-9 x^{2}+x^{2}+5 x+3 x-15 \\
& \begin{array}{r}
\left.\quad=x^{2}(x-5)+2 x(x-5)+3(x-5)\right] \\
{[\text {-ssrean+ } 3 \text { Bermen) }}
\end{array}
\end{aligned}
$$

$$
\begin{aligned}
& =(x-5)\left(x^{2}+x+3\right) \\
& \text { जितन } \text { जr, in, } 53=(x-5) \\
& \text { (5.) } x^{2}+3 x+2, x^{2}+1, x^{2}+x-2 \\
& \text { गु דn جor }=x^{2}+3 x+2 \\
& =x^{2}+2 x+x+2 \\
& 1-x(x+2)+1(x+2) \\
& =(x+2)(x+1) \text { है } \\
& \text { 2? thfor }=x^{2}-1 \\
& \left.=(x)^{2}-(1)^{2}-5\right)^{5} \\
& \varepsilon(x+1)(x-1) \\
& \text { G2 } 2 m a r=x^{2}+x-2 \\
& \text { (x) } 5 x+1+x^{2}+2 x=x-2 \\
& \left(1+\frac{x(x+2)-1(x+2)}{2 \times c}\right.
\end{aligned}
$$

$$
6 x \quad 2 m x a r=x^{4}+x^{2}+1
$$

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

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

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

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

$$
\begin{aligned}
& =(x+2)(x-1) \\
& \therefore \sqrt{\text { निता ला अभ, } 33}=(x+2)(x+1)(x-1) \\
& =(x+2)\left(x^{2}-1\right) \text { Ans: } \\
& \text { (6) } x^{3}-1, x^{3}+1, x^{4}+x^{2}+1 \\
& \text { วअ } \mathrm{am} \text { Øor }=x^{3}-1 \\
& =x^{3}-1^{3} \\
& =(x-1)\left(x^{2}+x+1\right) \cos ^{\operatorname{cic}\left(\tan ^{\operatorname{con}}\right.} \\
& 24 \operatorname{zm} \text { or }=x^{3}+1 . \\
& =(x+1)\left(x^{2}-x+1\right)
\end{aligned}
$$

$$
\begin{aligned}
& \therefore \text { तिबये } n, 3-1,5)=(x+1)\left(x^{2}-x+1\right) x \\
& (x-1)\left(x^{2}+x+1\right) \\
& 0_{0}^{x^{2}}=\left(x^{3}+1\right)\left(x^{3}-1\right) \\
& \text { (1) }=\left(x^{3}\right)^{2}-(1)^{2} \\
& \text { co } \\
& 5^{2^{5}-\infty}(0)=x^{6}-1 \text { Ans: } \\
& \text { (7) } x^{2}-x(a-c)-a c, x^{2}-x(a+c)+a c \text {, } \\
& a x^{3}-a^{3} x \\
& 2 z r \text { zhaor }=x^{2}-x(a-c)-a c \\
& =x^{2}-a x+e x+a c \\
& =x(x-a)+c(x-a) \\
& =(x-a)(x+c) \\
& \text { 2य1. } 2 \text { mor }=x^{2}-x(a+c)+a c \\
& =x^{2}-a x-c x+a c \\
& =x(x-a)-c(x-a)
\end{aligned}
$$

$$
\begin{aligned}
& x=(x-a)(x-c) \\
& \text { Gu } \quad+x\left(2 a r=a x^{3}-a^{3} x\right. \\
& =a x\left(x^{2}-a^{2}\right) \\
& =a x(x+a)(x-a) \\
& \therefore \text { ति(ल) न, zn, } s 3=a x(x+a)(x-a) \\
& X(x+c)(x-c) \\
& =a x\left(x^{2}-a^{2}\right)\left(x^{2}-c^{2}\right) \\
& \operatorname{sen}^{\text {vel }}{ }^{1 \text { car }} \text { Ans } \text { an }\left(x^{2}-a^{2}\right)\left(x^{2}-c^{2}\right) \\
& \text { (8) } x^{3}-x^{2}-3 x-9, x^{3}-2 x^{2}-2 x-3 \\
& \text { 2आ Info }=x^{3}-x^{2}-3 x-9 \\
& =x^{3}-3 x^{2}+2 x^{2}-6 x+3 x-9 \\
& =x^{2}(x-3)+2 x(x-3)+3(x-3) \\
& =(x-3)\left(x^{2}+2 x+3\right)
\end{aligned}
$$

$$
\text { (9) } 4 x^{2}+8 x-1299 x^{2}-9 x-54.6 x^{4}
$$

$$
-30 x^{2}+24
$$

$$
\begin{aligned}
&\left(\begin{array}{rl}
2 x &
\end{array}\right. \\
&= 4 x^{2}+8 x-12 \\
&=4\left(x^{2}+2 x-3\right) \\
&=4\left(x^{2}+3 x-x-3\right) \\
&=4\{x(x+3)-1(x+3)\} \\
&=4(x+3)(x-1)
\end{aligned}
$$

$$
\begin{aligned}
& \text { 24: } \operatorname{xn} \text { ar }=x^{3}-2 x^{2}-2 x-3 \\
& =x^{3} 3 x^{2}+x^{2} x+3 x+B x-3 \\
& =x^{2}(x+3)+x(x-3)+1(x-3) \\
& =(x-3)\left(x^{2}+x+1\right) \\
& \therefore \text { ब(नस) बं, } 30,33=(x-3)\left(x^{2}+2 x+3\right) \\
& x\left(x^{2}+x+1\right) \text { Ans. }
\end{aligned}
$$

$$
\begin{aligned}
& 24-\sqrt{x}(x)=9 x^{2}-9 x-54 \\
& =9\left(x^{2}-x-6\right) \\
& =9\left(x^{2}-8 x+2 x-6\right) \\
& =9\{x(x-3)+2(x-3)\} \\
& =9(x-3)(x+2) \\
& \text { (02) } \operatorname{mor}=6 x^{4}-30 x^{2}+24 \\
& =6\left(x^{4}-5 x^{2}-14\right) \\
& =6\left(x^{4}-4 x^{2}-x^{2}+4\right) \\
& =6\left\{x^{2}\left(x^{2}-4\right)-1\left(x^{2}-4\right)\right\} \\
& =6\left(x^{2}-4\right)\left(x^{2}-1\right) \\
& =6\left(x^{2}-2^{2}\right)\left(x^{2}-1\right) \\
& =6(x+2)(x-2)(x+1)(x-1) \\
& \text { cam त, } 4.9136 \text {-ब? ल, } 3 N, 53=36
\end{aligned}
$$

$$
\begin{aligned}
& \therefore \text { तिब बर. जै, an } 53=36(x+3)(x-3)(x+2) \\
& x\left(x^{2}-2\right):(x+1)(x-1) \\
& \left(8+\cdots\left(x^{2}-3^{2}\right)\left(x^{2}-2^{2}\right) x\right. \\
& \left\{(x+v) s+(1+2) x^{2}-1\right) \\
& =36+\left(x^{2}-9\right)\left(x^{2}-4\right)\left(x^{2}=1\right) \\
& \text { Ons: } \\
& \text { 8-x } x^{4}+6 x^{3}+8 x^{2}, x^{2}+2 x \\
& -8 \\
& \text { 23 प्रुad }=x\left(4-x^{2}\right) \\
& (8-8)\left(1-x\left(x^{2}-4\right)\right. \\
& (1+x) \text { if } z-x^{2}\left(x^{2}-2^{2}\right)^{3}(5)+2 \\
& (3-5)=-x(x+2)(x-2) \\
& \left.A(1)=N)(1+25)^{-3}+3\right)= \\
& \text { Jस2713 }
\end{aligned}
$$

$$
\begin{aligned}
& \text { 20 mbor }=x^{4}+6 x^{3}+8 x^{2} \\
& =x^{2}\left(x^{2}+6 x+8\right) \\
& =x^{2}\left(x^{2}+4 x+2 x+8\right) \\
& =x^{2}\{x(x+4)+2(x+4)\} \\
& =x^{2}(x+4)(x+2) \\
& 64 \geq m \not 20=x^{2}+2 x-8 \\
& =x^{2}+4 x-2 x-8 . \\
& =x(x+4)-2(x+4) \\
& =(x+4)(x-2) \\
& \therefore \text { विलिण ज. उत. } 3^{-}=x^{2}(x+4) \\
& x(x+2)(x-2) \\
& =x^{2}(x+4)\left(x^{2}-2^{2}\right) \\
& =t x^{2}(x+4)\left(x^{2}-4\right) R 2
\end{aligned}
$$

(11) รमत सीx,

$$
\begin{aligned}
& f(x)= \\
& f(x)=x^{2}+p x+q 0 \\
& \text { (ब), } g(x)=x^{2}+p x+q^{\prime} \\
& \text { (2n2g, }
\end{aligned}
$$

$$
\begin{aligned}
& \text { अgozn, } f(-a)=0 \text { [a00, } g(-a)=Q
\end{aligned}
$$

$$
\begin{aligned}
& \text { carno } f(x)=x^{2}+p x+q \\
& \therefore f(-a)=(-a)^{2}+p(-a)+q \\
& =a^{2}-p a+q \\
& \therefore a^{2}-p a+q=0 \ldots \text { (i) }
\end{aligned}
$$

fantro,

$$
\begin{aligned}
& g(x)=x^{2}+p^{\prime} x+q^{\prime} \\
& \therefore g(-a)=(-a)^{2}+p^{\prime}(-a)+a \\
&=a^{2}-p^{\prime} a+q \\
& \therefore a^{2}-p^{\prime} a+q^{\prime}=0
\end{aligned}
$$

 Ora mos.

$$
\begin{aligned}
& a^{2}-p a+q=a^{a}+p^{\prime} a+q^{\prime} \\
& \text { - Ir } a^{2}-p a-a^{2}+p^{\prime} a=q^{\prime}-a \\
& \text { Try }-p a+p a=q-q \\
& \text { Tr. } \left.\left.\left.\rightarrow a\left(p \not p p^{\prime}\right)=-(q-q)^{\prime}\right]^{(1)}\right)\right] \\
& \text { Nora } a(p-p)=q-q^{\prime} \\
& \therefore R\left(R-P^{\prime}\right)=q-q^{\prime} \\
& \text { (Aみmã) }
\end{aligned}
$$

(1)

$$
(a+b)^{3}=a^{3}+3 a^{2} b+3 a b+b^{2}+3 a b(a+b)
$$

$$
\begin{aligned}
& =a^{3}+3 a^{2} b+3 a b(a+b) \\
& =a^{3}+b^{3}+3 a b
\end{aligned}
$$

$$
\text { (2) } \begin{aligned}
(a-b)^{3} & =a^{3}-3 a^{2} b+3 a^{2} b^{2}-b^{3} \\
& =a^{3}-b^{3}-3 a b(a-b)
\end{aligned}
$$

(3) $a^{3}+b^{3}=(a+b)\left(a^{2} a b+b^{2}\right)$

$$
=(a+b)=3)^{3}-3 a b(a+b)
$$

(4)

$$
\begin{aligned}
a a^{3}-b^{3} & =(a-b)\left(a^{2}+a b+b^{2}\right) \\
& =(a-b)^{3}+3 a b(a-b)
\end{aligned}
$$

$$
\begin{aligned}
& \text { (5) }(p+x)(q+x)(n+n)=p q n+(p q+a n+n) \\
& x x+(p+a+r) x^{2}+x^{3}
\end{aligned}
$$

$$
\begin{aligned}
& \text { शिनूखी लनी-3.2 } \\
& \text { इउस्ण मूर्य नुल }
\end{aligned}
$$

$$
\begin{aligned}
& 384 \text { अनल दrora } \\
& (2 x+3 y-4 z)^{3}+(2 x-3 x y+4 z)^{3}+12 x\left\{4 x^{2}-\right. \\
& \left.(3 x-4 z)^{2}\right\} \\
& =(2 x+3 y-4 z)^{3}+(2 x-3 y+4 z)^{3}+3 \\
& (2 x+3 y-4 z)(2 x-3 y+4 z) \\
& x(2 x+3 y-4 z+2 x-3 y+4 z) \\
& =(2 x+3 y-4 z+2 x-3 y+4 z)^{3} \\
& =(4 x)^{3} \\
& =64 n^{3} \text { Ams } \\
& \text { 3:10 chore tanco. } \\
& x-y=8 \\
& x y=65
\end{aligned}
$$

$$
\begin{aligned}
& \therefore \text { (1) } 3 \text { 3 arxor }=x^{3}-y^{3}-16(x-y)^{2} \\
& =(x-y)^{3}+3 x y(x-y)-16(x-y)^{2} \\
& =8^{3}+3 \times 65 \times 8-16 \times 8^{2} \\
& =512+1560-1024 \\
& =2072-1024 \\
& =1048 \text { Ans: }
\end{aligned}
$$

$$
\begin{aligned}
& x+y=2 \\
& x^{2}+y^{2}=4 \\
& \text { (axन3) } x^{2}+y^{2}=4 \\
& -a_{0}(x+y)^{2}-2 x y=4 \\
& \text { तr. } 2^{2}-2 x y=4 \text { [3ल तुजn? ] }
\end{aligned}
$$

$$
\begin{aligned}
\pi \cdot 4-2 x y & =4 \\
\pi r,-2 x y & =4-4 \\
2, x y & =\frac{0}{-2} \\
\therefore x y & =0 \\
\therefore x^{3}+y^{3} & =(x+y)^{3}-3 x y(x+y) \\
& =2^{3}-3 \cdot 0 \cdot 2 \\
& =8-0 \\
& =8
\end{aligned}
$$

CORO: 10 raur tamz?

$$
\begin{gathered}
a+b=m \\
a^{2}+b^{2}=n \\
a^{3}+b^{3}=p^{3}
\end{gathered}
$$

(goral,

$$
\begin{aligned}
& m^{3}+2 p^{3} \\
= & (a+b)^{3}+2\left(a^{3}+b^{3}\right) \text { Jewel's care Hand Note } \\
= & a^{3}+b^{3}+3 a b(a+b)+2\left(a^{3}+b^{3}\right) \\
= & 3\left(a^{3}+b^{3}\right)+3 a b(a+b) \\
= & 3\left\{\left(a^{3}+b^{3}\right)+a b(a+b)\right\} \\
= & 3\left\{(a+b)\left(a^{2}-a b+b^{2}\right)+a b(a+b)\right\} \\
= & 3(a+b)\left(a^{2}-a b+b^{2}+a b\right) \\
= & 3(a+b)\left(a^{2}+b^{2}\right) \\
& =3 m n \\
\therefore & m^{3}+2 p^{3}=3 m n
\end{aligned}
$$

(Proved)

(मuidarar- 3.7
(11) झत कणनि,

$$
\begin{aligned}
& f(x)=x^{2}+p x+q \\
& f^{\prime}(x)=x^{2}+p x+q^{\prime}
\end{aligned}
$$


$(x+a), f(x)$ बतr, $f^{\prime}(x)$ बती जा, sा, 53 शूत्य चनि $f(x)=0$ ad, $f^{\prime}(x)=0$ 2.1.

$$
\begin{aligned}
\therefore f(x) & =x^{2}+p x+q \\
\therefore f(-a) & =(-a)^{2}+p(-a)+q \\
& =a^{2} \times p a+q \\
& =a^{2}-p a+q
\end{aligned}
$$

$$
\begin{aligned}
f^{\prime}(x) & =x^{2}+p^{\prime} x+q^{\prime} \\
\therefore f^{\prime}(-a) & =(-a)^{2}+p^{\prime}(-a)+q^{\prime} \\
& =a^{2}-p^{\prime} a+q^{\prime}
\end{aligned}
$$



$$
a^{2}-p a+q=a^{2}-p^{\prime} a+q^{\prime}
$$

* $2 e^{2}+x+1$
$=x^{2}+2 x+1-x$
$(x+1)^{2}-x$
$=(x+1)^{2}-(\sqrt{x})^{2}$
$=(x+\sqrt{x}+1)(x+\sqrt{x}+1) R i$
$4 a+b=\sqrt{7}$ are $a-b=\sqrt{3}$ 2ल, $a b\left(a^{2}+b^{2}\right)=5$,

$$
\therefore L \cdot H \cdot S=a b\left(a^{2}+b^{2}\right)
$$

$$
=\frac{8 a b\left(a^{2}+b^{2}\right)}{8}
$$

$$
=\frac{4 a b \cdot 2\left(a^{2}+b^{2}\right)}{8}
$$

$$
=\frac{\left\{(a+b)^{2}-(a-b)^{2}\right\}\left\{\left\{\left(a+b^{2}\right)+(a-b)\right\}\right.}{8}
$$

$$
=\frac{\left\{(\sqrt{7})^{2}-(\sqrt{3})^{2}\right\}\left\{(\sqrt{7})^{2}+(\sqrt{3})^{2}\right\}}{8}
$$

$$
=\frac{7-3 \times 7+3}{8}
$$

$$
=\frac{4 \times 10}{8}
$$

$$
=\frac{40^{\circ}}{8}=5 \mathrm{R}
$$

