

ಅಭ್ಯಾಸ 13.1

13.1.1. ಈ ಕೆಳಗಿನ ಬೀಜಪದಗಳಿಗೆ ಸಾಮಾನ್ಯ ಅಪವರ್ತನಗಳನ್ನು ಕಂಡು ಹಿಡಿಯಿರಿ.

ಬೀಜಪದಗಳು	ಅಪವರ್ತನಗಳು	ಸಾಮಾನ್ಯ ಅಪವರ್ತನ =
(i) $12x, 36$	$12x = 2 \cdot 2 \cdot 3 \cdot x$ $36 = 2 \cdot 2 \cdot 3 \cdot 3$	$2 \cdot 2 \cdot 3 = 12$
(ii) $2y, 22xy$	$2y = 2 \cdot y$ $22xy = 2 \cdot 11 \cdot x \cdot y$	$2 \cdot y = 2y$
(iii) $14pq, 28p^2q^2$	$14pq = 2 \cdot 7 \cdot p \cdot q$ $28p^2q^2 = 2 \cdot 2 \cdot 7 \cdot p \cdot p \cdot q \cdot q$	$2 \cdot 7 \cdot p \cdot q = 14pq$
(iv) $2x, 3x^2, 4$	$2x = 2 \cdot x$ $3x^2 = 3 \cdot x \cdot x$ $4 = 2 \cdot 2$	1
(v) $6abc, 24ab^2, 12a^2b$	$6abc = 2 \cdot 3 \cdot a \cdot b \cdot c$ $24ab^2 = 2 \cdot 2 \cdot 2 \cdot 3 \cdot a \cdot b \cdot b$ $12a^2b = 2 \cdot 2 \cdot 3 \cdot a \cdot a \cdot b$	$2 \cdot 3 \cdot a \cdot b = 6ab$
(vi) $16x^3, -4x^2, 32x$	$16x^3 = 2 \cdot 2 \cdot 2 \cdot 2 \cdot x \cdot x \cdot x$ $-4x^2 = -2 \cdot 2 \cdot x \cdot x$ $32x = 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot x$	$2 \cdot 2 \cdot x = 4x$
(vii) $10pq, 20qr, 30rp$	$10pq = 2 \cdot 5 \cdot p \cdot q$ $20qr = 2 \cdot 2 \cdot 5 \cdot q \cdot r$ $30rp = 2 \cdot 3 \cdot 5 \cdot r \cdot p$	$2 \cdot 5 = 10$
(viii) $3x^2y^3, 10x^3y^2, 6x^2y^2z$	$3x^2y^3 = 3 \cdot x \cdot x \cdot y \cdot y \cdot y$ $10x^3y^2 = 2 \cdot 5 \cdot x \cdot x \cdot x \cdot y \cdot y$ $6x^2y^2z = 2 \cdot 3 \cdot x \cdot x \cdot y \cdot y \cdot z$	$x \cdot x \cdot y \cdot y = x^2y^2$

13.1.2. ಈ ಕೆಳಗಿನ ಬೀಜೋಕ್ತಿಗಳನ್ನು ಅಪವರ್ತಿಸಿ.

ಬೀಜೋಕ್ತಿ	ಅಪವರ್ತನಗಳು	ಅಪವರ್ತಿಸಿದಾಗ
(i) $7x-42$	$7x=7*x$ $-42=7*(-6)$	$7x-42=7*x-7*6=7(x-6)$
(ii) $6p-12q$	$6p=2*3*p$ $-12q=-2*2*3*q$	$6p-12q=2*3*p-2*2*3*q=6(p-2q)$
(iii) $7a^2+14a$	$7a^2=7*a*a$ $14a=2*7*a$	$7a^2+14a=7*a*a+2*7*a=7a(a+2)$
(iv) $-16z+20z^3$	$-16z=-2*2*2*2*z$ $20z^3=2*2*5*z*z*z$	$-16z+20z^3=-2*2*2*2*z+2*2*5*z*z*z=4z(-4+5z^2)$
(v) $20l^2m+30alm$	$20l^2m=2*2*5*l*l*m$ $30alm=2*3*5*a*l*m$	$20l^2m+30alm=2*2*5*l*l*m+2*3*5*a*l*m=10lm(2l+3a)$
(vi) $5x^2y-15xy^2$	$5x^2y=5*x*x*y$ $-15xy^2=-3*5*x*y*y$	$5x^2y-15xy^2=5*x*x*y-3*5*x*y*y=5xy(x-3y)$
(vii) $10a^2-15b^2+20c^2$	$10a^2=2*5*a*a$ $-15b^2=-3*5*b*b$ $20c^2=2*2*5*c*c$	$10a^2-15b^2+20c^2=2*5*a*a-3*5*b*b+2*2*5*c*c=5(2a^2-3b^2+4c^2)$
(viii) $-4a^2+4ab-4ca$	$-4a^2=-2*2*a*a$ $4ab=2*2*a*b$ $-4ca=-2*2*a*c$	$-4a^2+4ab-4ca=-2*2*a*a+2*2*a*b-2*2*a*c=4a(-a+b-c)$
(ix) $x^2yz+xy^2z+xyz^2$	$x^2yz=x*x*y*z$ $xy^2z=x*y*y*z$ $xyz^2=x*y*z*z$	$x^2yz+xy^2z+xyz^2=x*x*y*z+x*y*y*z+x*y*z*z=xyz(x+y+z)$
(x) ax^2y+bxy^2+cxyz	$ax^2y=a*x*x*y$ $bxy^2=b*x*y*y$ $cxyz^2=c*x*y*z$	$ax^2y+bxy^2+cxyz^2=a*x*x*y+b*x*y*y+c*x*y*z*z=xy(ax+by+cz)$

13.1.3. ಅಪವರ್ತಿಸಿ.

$$\begin{aligned}
 \text{(i)} \quad & x^2 + xy + 8x + 8y \\
 &= x \cdot x + x \cdot y + 8 \cdot x + 8 \cdot y \\
 &= x(x+y) + 8(x+y) \\
 &= (x+y)(x+8)
 \end{aligned}$$

$$\begin{aligned}
 \text{(ii)} \quad & 15xy - 6x + 5y - 2 \\
 &= 3 \cdot 5 \cdot x \cdot y - 3 \cdot 2 \cdot x + 5 \cdot y - 2 \\
 &= 3x(5y-2) + 1(5y-2) \\
 &= (5y-2)(3x+1)
 \end{aligned}$$

$$\begin{aligned}
 \text{(iii)} \quad & ax + bx - ay - by \\
 &= a \cdot x + b \cdot x - a \cdot y - b \cdot y \\
 &= x(a+b) - y(a+b) \\
 &= (a+b)(x-y)
 \end{aligned}$$

$$\begin{aligned}
 \text{(iv)} \quad & 15pq + 15 + 9q + 25p \\
 &= 15pq + 9q + 15 + 25p \quad (\text{ಮರುಜೋಡಣೆ}) \\
 &= 3 \cdot 5 \cdot p \cdot q + 3 \cdot 3 \cdot q + 3 \cdot 5 + 5 \cdot 5 \cdot p \\
 &= 3q(5p+3) + 5(3+5p) \quad \text{---} (5p+3=3+5p) \\
 &= (5p+3)(3q+5)
 \end{aligned}$$

$$\begin{aligned}
 \text{(v)} \quad & z - 7 + 7xy - xyz \\
 &= z - 7 - xyz + 7xy \quad (\text{ಮರುಜೋಡಣೆ}) \\
 &= 1(z-7) - x \cdot y \cdot z + 7 \cdot x \cdot y \\
 &= 1(z-7) - xy(z-7) \\
 &= (z-7)(1-xy)
 \end{aligned}$$

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ಅಭ್ಯಾಸ 13.2

13.2.1. ಈ ಕೆಳಗಿನ ಬೀಜೋಕ್ತಿಗಳನ್ನು ಅಪವರ್ತಿಸಿ.

ಇಲ್ಲಿ $(a + b)^2 = a^2 + b^2 + 2ab$ ---ಸ.(I) ಮತ್ತು $(a - b)^2 = a^2 + b^2 - 2ab$ ----ಸ.(II) ಎನ್ನುವ ನಿತ್ಯಸಮೀಕರಣಗಳನ್ನು ಉಪಯೋಗಿಸಿದೆ.

$$\begin{aligned} \text{(i)} \quad & a^2 + 8a + 16 \\ &= (a)^2 + 2 \cdot 4a + 4^2 \text{ -----ಸ.(I)} \\ &= (a+4)^2 \end{aligned}$$

$$\begin{aligned} \text{(ii)} \quad & p^2 - 10p + 25 \\ &= (p)^2 - 2 \cdot 5p + 5^2 \text{ -----ಸ.(II)} \\ &= (p-5)^2 \end{aligned}$$

$$\begin{aligned} \text{(iii)} \quad & 25m^2 + 30m + 9 \\ &= (5m)^2 + 2 \cdot 5m \cdot 3 + 3^2 \text{ -----ಸ.(I)} \\ &= (5m+3)^2 \end{aligned}$$

$$\begin{aligned} \text{(iv)} \quad & 49y^2 + 84yz + 36z^2 \\ &= (7y)^2 + 2 \cdot 7y \cdot 6z + (6z)^2 \text{ -----ಸ.(I)} \\ &= (7y+6z)^2 \end{aligned}$$

$$\begin{aligned} \text{(v)} \quad & 4x^2 - 8x + 4 \\ &= 4(x^2 - 2x + 1) \\ &= 4(x^2 - 2 \cdot x + 1^2) \text{ -----ಸ.(II)} \\ &= 4(x-1)^2 \end{aligned}$$

$$\begin{aligned} \text{(vi)} \quad & 121b^2 - 88bc + 16c^2 \\ &= (11b)^2 - 2 \cdot 11b \cdot 4c + (4c)^2 \text{ ----ಸ.(II)} \\ &= (11b-4c)^2 \end{aligned}$$

$$\begin{aligned} \text{(vii)} \quad & (l+m)^2 - 4lm \text{ -----ಸ.(I)} \\ &= l^2 + m^2 + 2lm - 4lm \\ &= l^2 + m^2 - 2lm \text{ -----ಸ.(II)} \\ &= (l-m)^2 \end{aligned}$$

$$\begin{aligned} \text{(viii)} \quad & a^4 + 2a^2b^2 + b^4 \\ &= (a^2)^2 + 2a^2b^2 + (b^2)^2 \text{ -----ಸ.(I)} \\ &= (a^2+b^2)^2 \end{aligned}$$

13.2.2. ಅಪವರ್ತಿಸಿ.

$a^2 - b^2 = (a + b)(a - b)$ -----ಸ.(III) ಎನ್ನುವ ನಿತ್ಯಸಮೀಕರಣ ಮತ್ತು ಹಿಂದೆ ಉಪಯೋಗಿಸಿದ ಸಮೀಕರಣಗಳನ್ನು ಉಪಯೋಗಿಸಿದೆ.

(i) $4p^2 - 9q^2$ $= (2p)^2 - (3q)^2$ -----ಸ.(III) $= (2p+3q)(2p-3q)$
(ii) $63a^2 - 112b^2$ $= 7(9a^2 - 16b^2)$ $= 7[(3a)^2 - (4b)^2]$ -----ಸ.(III) $= 7(3a+4b)(3a-4b)$
(iii) $49x^2 - 36$ $= (7x)^2 - 6^2$ -----ಸ.(III) $= (7x+6)(7x-6)$
(iv) $16x^5 - 9x^3$ $= 16x^3(x^2 - 3^2)$ -----ಸ.(III) $= 16x^3(x+3)(x-3)$
(v) $(l+m)^2 - (l-m)^2$ ----- ಸ.(I)& ಸ.(II) $= l^2 + m^2 + 2lm - (l^2 + m^2 - 2lm)$ $= l^2 + m^2 + 2lm - l^2 - m^2 + 2lm$ $= 4lm$
(vi) $9x^2 y^2 - 16$ $= (3xy)^2 - 4^2$ ----- ಸ. (III) $= (3xy+4)(3xy-4)$
(vii) $(x^2 - 2xy + y^2) - z^2$ $= (x-y)^2 - z^2$ ----- ಸ. (II) & ಸ. (III) $= (x-y+z)(x-y-z)$
(viii) $25a^2 - 4b^2 + 28bc - 49c^2$ $= 25a^2 - \{4b^2 - 28bc + 49c^2\}$ $= 25a^2 - \{(2b)^2 - 2*14bc + (7c)^2\}$ ----- ಸ. (II) $= (5a)^2 - \{(2b-7c)^2\}$ ----- ಸ. (II) & ಸ. (III) $= (5a+2b-7c)(5a-(2b-7c))$ $= (5a+2b-7c)(5a-2b+7c)$

13.2.3. ಈ ಬೀಜೋಕ್ತಿಗಳನ್ನು ಅಪವರ್ತಿಸಿ.

(i) $ax^2 + bx$ $= a * x * x + b * x$ $= x(ax + b)$
(ii) $7p^2 + 21q^2$ $= 7 * p * p + 7 * 3 * q * q$ $= 7(p^2 + 3q^2)$
(iii) $2x^3 + 2xy^2 + 2xz^2$ $= 2 * x * x * x + 2 * x * y * y + 2 * x * z * z$ $= 2x(x^2 + y^2 + z^2)$
(iv) $am^2 + bm^2 + bn^2 + an^2$ $= a * m * m + b * m * m + b * n * n + a * n * n$ $= m^2(a + b) + n^2(a + b)$ $= (a + b)(m^2 + n^2)$
(v) $(lm + l) + m + 1$ $= l(m + 1) + (m + 1)$ $= (m + 1)(l + 1)$
(vi) $y(y + z) + 9(y + z)$ $= (y + z)(y + 9)$
(vii) $5y^2 - 20y - 8z + 2yz$ $= 5y^2 - 20y + 2yz - 8z$ $= 5 * y * y - 5 * 4 * y + 2 * y * z - 2 * 4 * z$ $= 5y(y - 4) + 2z(y - 4)$ $= (y - 4)(5y + 2z)$
(viii) $10ab + 4a + 5b + 2$ $= 2a(5b + 2) + (5b + 2)$ $= (5b + 2)(2a + 1)$
(ix) $6xy - 4y + 6 - 9x$ $6xy - 4y - 9x + 6$ $= 2y(3x - 2) - 3(3x - 2)$ $= (3x - 2)(2y - 3)$

13.2.4. ಅಪವರ್ತಿಸಿ.

$$\begin{aligned}
 \text{(i) } a^4 - b^4 &= (a^2)^2 - (b^2)^2 \text{----- ಸ. (III)} \\
 &= (a^2 + b^2)(a^2 - b^2) \text{----- ಸ. (III)} \\
 &= (a^2 + b^2)(a + b)(a - b)
 \end{aligned}$$

$$\begin{aligned}
 \text{(ii) } p^4 - 81 &= p^4 - 9^2 \text{----- ಸ. (III)} \\
 &= (p^2 + 9)(p^2 - 9) \\
 &= (p^2 + 9)(p^2 - 3^2) \text{----- ಸ. (III)} \\
 &= (p^2 + 9)(p + 3)(p - 3)
 \end{aligned}$$

$$\begin{aligned}
 \text{(iii) } x^4 - (y + z)^4 &= (x^2)^2 - \{(y + z)^2\}^2 \text{----- ಸ. (III)} \\
 &= \{x^2 + (y + z)^2\} \{x^2 - (y + z)^2\} \text{----- ಸ. (III)} \\
 &= \{x^2 + (y + z)^2\} \{x + (y + z)\} \{x - (y + z)\} \\
 &= \{x^2 + (y + z)^2\} \{x + y + z\} \{x - y - z\}
 \end{aligned}$$

$$\begin{aligned}
 \text{(iv) } x^4 - (x - z)^4 &= (x^2)^2 - \{(x - z)^2\}^2 \text{----- ಸ. (III)} \\
 &= \{x^2 + (x - z)^2\} \{x^2 - (x - z)^2\} \text{----- ಸ. (III)} \\
 &= \{x^2 + x^2 + z^2 - 2xz\} \{x + (x - z)\} \{x - (x - z)\} \\
 &= \{2x^2 + z^2 - 2xz\} \{2x - z\} \{z\} \\
 &= z(2x - z)(2x^2 + z^2 - 2xz)
 \end{aligned}$$

$$\begin{aligned}
 \text{(v) } a^4 - 2a^2b^2 + b^4 &= (a^2)^2 + (b^2)^2 - 2a^2b^2 \text{----- ಸ. (II)} \\
 &= \{a^2 - b^2\}^2 \text{----- ಸ. (III)} \\
 &= \{(a + b)(a - b)\}^2 \\
 &= (a + b)^2(a - b)^2
 \end{aligned}$$

13.2.5. ಈ ಕೆಳಗಿನ ಬೀಜೋಕ್ತಿಗಳನ್ನು ಅಪವರ್ತಿಸಿ.

$$\begin{aligned} \text{(i)} \quad & p^2 + 6p + 8 \\ &= (p^2 + 6p + 9) - 1 \text{----- ಸ. (I)} \\ &= (p+3)^2 - 1 \text{----- ಸ. (II)} \\ &= \{(p+3)+1\} \{(p+3)-1\} \\ &= (p+4)(p+2) \end{aligned}$$

$$\begin{aligned} \text{(ii)} \quad & q^2 - 10q + 21 \\ &= (q^2 - 10q + 25) - 4 \text{----- ಸ. (I)} \\ &= (q-5)^2 - 2^2 \text{----- ಸ. (II)} \\ &= \{(q-5)+2\} \{(q-5)-2\} \\ &= (q-3)(q-7) \end{aligned}$$

$$\begin{aligned} \text{(ii)} \quad & p^2 + 6p - 16 \\ &= p^2 + 6p + 9 - 25 \text{----- ಸ. (I)} \\ &= (p+3)^2 - 5^2 \text{----- ಸ. (II)} \\ &= \{(p+3)+5\} \{(p+3)-5\} \\ &= (p+8)(p-2) \end{aligned}$$

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ಅಭ್ಯಾಸ 13.3

13.3.1. ಈ ಕೆಳಗಿನ ಭಾಗಕಾರಗಳನ್ನು ಮಾಡಿ:

$$\begin{aligned} \text{(i)} & 28x^4 \div 56x \\ &= \frac{28 * x * x * x * x}{28 * 2 * x} \\ &= \frac{x * x * x}{2} \\ &= \frac{x^3}{2} \end{aligned}$$

$$\begin{aligned} \text{(ii)} & -36y^3 \div 9y^2 \\ &= \frac{-9 * 4 * y * y * y}{9 * y * y} \\ &= -4y \end{aligned}$$

$$\begin{aligned} \text{(iii)} & 66pq^2r^3 \div 11qr^2 \\ &= \frac{11 * 6 * p * q * q * r * r * r}{11 * q * r * r} \\ &= 6pqr \end{aligned}$$

$$\begin{aligned} \text{(iv)} & 34x^3y^3z^3 \div 51xy^2z^3 \\ &= \frac{17 * 2 * x * x * x * y * y * y * z * z * z}{17 * 3 * x * y * y * z * z * z} \\ &= \frac{2 * x * x * y}{3} \\ &= \frac{2}{3} x^2y \end{aligned}$$

$$\begin{aligned} \text{(v)} & 12a^8b^8 \div (-6a^6b^4) \\ &= \frac{6 * 2 * (a * a * a * a * a * a * a * a) * (b * b * b * b * b * b * b * b)}{-6(a * a * a * a * a * a) * (b * b * b * b)} \\ &= - \frac{2 * a * a * b * b * b * b}{1} \\ &= -2a^2b^4 \end{aligned}$$

13.3.2. ಈ ಕೆಳಗಿನ ಬಹುಪದೋಕ್ತಿಗಳನ್ನು ಕೊಟ್ಟಿರುವ ಏಕಪದೋಕ್ತಿಯಿಂದ ಭಾಗಿಸಿ.

$$(i) (5x^2 - 6x) \div 3x$$

$$= \frac{5x^2}{3x} - \frac{6x}{3x}$$

$$= \frac{5}{3}x - 2$$

$$= \frac{1}{3}(5x - 6)$$

$$(ii) (3y^8 - 4y^6 + 5y^4) \div y^4$$

$$= \frac{3y^8}{y^4} - \frac{4y^6}{y^4} + \frac{5y^4}{y^4}$$

$$= 3y^4 - 4y^2 + 5$$

$$(iii) 8(x^3y^2z^2 + x^2y^3z^2 + x^2y^2z^3) \div 4x^2y^2z^2$$

$$= \frac{8x^3y^2z^2}{4x^2y^2z^2} + \frac{8x^2y^3z^2}{4x^2y^2z^2} + \frac{8x^2y^2z^3}{4x^2y^2z^2}$$

$$= 2x + 2y + 2z$$

$$= 2(x + y + z)$$

$$(iv) (x^3 + 2x^2 + 3x) \div 2x$$

$$= x(x^2 + 2x + 3) \div 2x$$

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

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

$$(v) (p^3q^6 - p^6q^3) \div p^3q^3$$

$$= \frac{p^3q^3(q^3 - p^3)}{p^3q^3}$$

$$= q^3 - p^3$$

13.3.3. ಈ ಕೆಳಗಿನ ಭಾಗಾಕಾರಗಳನ್ನು ಮಾಡಿ.

$$(i) (10x-25) \div 5$$

$$= \frac{5(2x-5)}{5}$$

$$= 2x-5$$

$$(ii) (10x-25) \div (2x-5)$$

$$= \frac{5(2x-5)}{(2x-5)}$$

$$= 5$$

$$(iii) 10y(6y+21) \div 5(2y+7)$$

$$= \frac{5 \cdot 2y \cdot 3(2y+7)}{5(2y+7)}$$

$$= 6y$$

$$(iv) 9x^2y^2(3z-24) \div 27xy(z-8)$$

$$= \frac{9 \cdot x^2y^2 \cdot 3(z-8)}{9 \cdot 3xy(z-8)}$$

$$= xy$$

$$(v) 96abc(3a-12)(5b-30) \div 144(a-4)(b-6)$$

$$= \frac{12 \cdot 2 \cdot 4abc \cdot 3(a-4) \cdot 5(b-6)}{12 \cdot 12 \cdot (a-4)(b-6)}$$

$$= 10abc$$

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13.3.4. ಕೆಳಗೆ ತಿಳಿಸಿರುವಂತೆ ಭಾಗಿಸಿ.

$$\begin{aligned} \text{(i)} & 5(2x+1)(3x+5) \div (2x+1) \\ &= \frac{5(2x+1)(3x+5)}{(2x+1)} \\ &= 5(3x+5) \end{aligned}$$

$$\begin{aligned} \text{(ii)} & 26xy(x+5)(y-4) \div 13x(y-4) \\ &= \frac{2 \cdot 13xy(x+5)(y-4)}{13x(y-4)} \\ &= 2y(x+5) \end{aligned}$$

$$\begin{aligned} \text{(iii)} & 52pqr(p+q)(q+r)(r+p) \div 104pq(q+r)(r+p) \\ &= \frac{52pqr(p+q)(q+r)(r+p)}{2 \cdot 52pq(q+r)(r+p)} \\ &= \frac{1}{2} r(p+q) \end{aligned}$$

$$\begin{aligned} \text{(iv)} & 20(y+4)(y^2+5y+3) \div 5(y+4) \\ &= 4 \cdot 5(y+4)(y^2+5y+3) \div 5(y+4) \\ &= 4(y^2+5y+3) \end{aligned}$$

$$\begin{aligned} \text{(v)} & x(x+1)(x+2)(x+3) \div x(x+1) \\ &= (x+2)(x+3) \end{aligned}$$

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13.3.5. ಈ ಕೆಳಗಿನ ಬೀಜೋಕ್ತಿಗಳನ್ನು ಅಪವರ್ತಿಸಿ ನಂತರ ಸೂಚಿಸಿದಂತೆ ಭಾಗಿಸಿ.

ಬೀಜೋಕ್ತಿ	ಅಂಶವನ್ನು ಅಪವರ್ತಿಸಿದಾಗ	ಅಂಶ ಮತ್ತು ಭೇದಗಳಲ್ಲಿನ ಸಾಮಾನ್ಯ ಪದಗಳನ್ನು ಹೊಡೆದು ಹಾಕಿದಾಗ
(i) $(y^2 + 7y + 10) \div (y + 5)$	$(y^2 + 7y + 10)$ $= y^2 + 2y + 5y + 10$ $= y(y + 2) + 5(y + 2)$ $= (y + 2)(y + 5)$	$= (y + 2)$
(ii) $(m^2 - 14m - 32) \div (m + 2)$	$(m^2 - 14m - 32)$ $= m^2 - 16m + 2m - 32$ $= m(m - 16) + 2(m - 16)$ $= (m - 16)(m + 2)$	$= (m - 16)$
(iii) $(5p^2 - 25p + 20) \div (p - 1)$	$(5p^2 - 25p + 20)$ $= 5\{p^2 - 5p + 4\}$ $= 5\{p^2 - p - 4p + 4\}$ $= 5\{p(p - 1) - 4(p - 1)\}$ $= 5 \cdot (p - 1)(p - 4)$	$= 5(p - 4)$
(iv) $4yz(z^2 + 6z - 16) \div 2y(z + 8)$	$4yz(z^2 + 6z - 16)$ $= 4yz\{z^2 + 8z - 2z - 16\}$ $= 4yz\{z(z + 8) - 2(z + 8)\}$ $= 4yz\{(z + 8)(z - 2)\}$ $= 4yz(z + 8)(z - 2)$	$= 2z(z - 2)$
(v) $5pq(p^2 - q^2) \div 2p(p + q)$	$5pq(p^2 - q^2)$ $= 5pq(p + q)(p - q)$	$= \frac{5}{2} q(p - q)$
(vi) $12xy(9x^2 - 16y^2) \div 4xy(3x + 4y)$	$12xy(9x^2 - 16y^2)$ $= 12xy\{(3x)^2 - (4y)^2\}$ $= 12xy\{(3x + 4y)(3x - 4y)\}$ $= 12xy(3x + 4y)(3x - 4y)$	$= 3(3x - 4y)$
(vii) $39y^3(50y^2 - 98) \div 26y^2(5y + 7)$	$39y^3(50y^2 - 98)$ $= 39y^3 \cdot 2 \cdot \{(25y^2 - 49)\}$ $= 78y^3\{(5y)^2 - (7)^2\}$ $= 78y^3\{(5y + 7)(5y - 7)\}$ $= 78y^3(5y + 7)(5y - 7)$	$= 3y(5y - 7)$

ಅಭ್ಯಾಸ 13.4

13.4 ಈ ಕೆಳಗಿನ ಹೇಳಿಕೆಗಳಲ್ಲಿರುವ ದೋಷಗಳನ್ನು ಹುಡುಕಿ ಸರಿಪಡಿಸಿರಿ.

ಹೇಳಿಕೆ	ಎಡಭಾಗ(ಸರಿಪಡಿಸಿದ್ದು)
1. $4(x-5) = 4x-5$	$4(x-5) = 4x-20$
2. $x(3x+2) = 3x^2+2$	$x(3x+2) = 3x^2+2x$
3. $2x+3y = 5xy$	$2x+3y = 2x+3y$
4. $x+2x+3x = 5x$	$x+2x+3x = 6x$
5. $5y+2y+y-7y = 0$	$5y+2y+y-7y = y$
6. $3x+2x = 5x^2$	$3x+2x = 5x$
7. $(2x)^2+4(2x)+7 = 2x^2+8x+7$	$(2x)^2+4(2x)+7 = 4x^2+8x+7$
8. $(2x)^2+5x = 4x+5x = 9x$	$(2x)^2+5x = 4x^2+5x$
9. $(3x+2)^2 = 3x^2+6x+4$	$(3x+2)^2 = 9x^2+12x+4$

10. $x = -3$ ಎಂದು

	ಸರಿಯಾದ ಉತ್ತರ
(a) x^2+5x+4 ನಲ್ಲಿ ಹಾಕಿದಾಗ $(-3)^2+5(-3)+4=9+2+4=15$ ಆಗಿರುತ್ತದೆ.	$x^2+5x+4=(-3)^2+5*(-3)+4=9-15+4=-2$
(b) x^2-5x+4 ನಲ್ಲಿ ಹಾಕಿದಾಗ $(-3)^2-5(-3)+4=9-15+4=-2$ ಆಗಿರುತ್ತದೆ.	$x^2-5x+4=(-3)^2-5(-3)+4=9+15+4=28$
(c) x^2+5x ನಲ್ಲಿ ಹಾಕಿದಾಗ $(-3)^2+5(-3)=-9-15=-24$ ಆಗಿರುತ್ತದೆ.	$x^2+5x=(-3)^2+5(-3)=9-15=-6$

	ಸರಿಯಾದ ಉತ್ತರ
11. $(y-3)^2 = y^2 - 9$	$(y-3)^2 = y^2 + (3)^2 - 2*y*3 = y^2 + 9 - 6y$
12. $(z+5)^2 = z^2 + 25$	$(z+5)^2 = z^2 + (5)^2 + 2*z*5 = z^2 + 25 + 10z$
13. $(2a+3b)(a-b) = 2a^2 - 3b^2$	$(2a+3b)(a-b) = 2a(a-b) + 3b(a-b) = 2a^2 - 2ab + 3ba - 3b^2 = 2a^2 + ab - 3b^2$
14. $(a+4)(a+2) = a^2 + 8$	$(a+4)(a+2) = a(a+2) + 4(a+2) = a^2 + 2a + 4a + 8 = a^2 + 6a + 8$
15. $(a-4)(a-2) = a^2 - 8$	$(a-4)(a-2) = a(a-2) - 4(a-2) = a^2 - 2a - 4a + 8 = a^2 - 6a + 8$
16. $\frac{36x^2}{36x^2} = 0$	$\frac{36x^2}{36x^2} = 1$
17. $\frac{3x^2+1}{3x^2} = 1 + 1 = 2$	$\frac{3x^2+1}{3x^2} = 1 + \frac{1}{3x^2}$
18. $\frac{3x}{3x+2} = \frac{1}{2}$	$\frac{3x}{3x+2} = \frac{3x}{3x+2}$
19. $\frac{3}{4x+3} = \frac{1}{4x}$	$\frac{3}{4x+3} = \frac{3}{4x+3}$
20. $\frac{4x+5}{4x} = 5$	$\frac{4x+5}{4x} = 1 + \frac{5}{4x}$
21. $\frac{7x+5}{5} = 7x$	$\frac{7x+5}{5} = \frac{7x}{5} + 1$

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