

**SSLC  
Mathematics**

ಅಧ್ಯಾಯ-7  
**ಕರಣಿಗಳು**

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ಅಧ್ಯಾಯ 7  
ಕರಣಿಗಳು

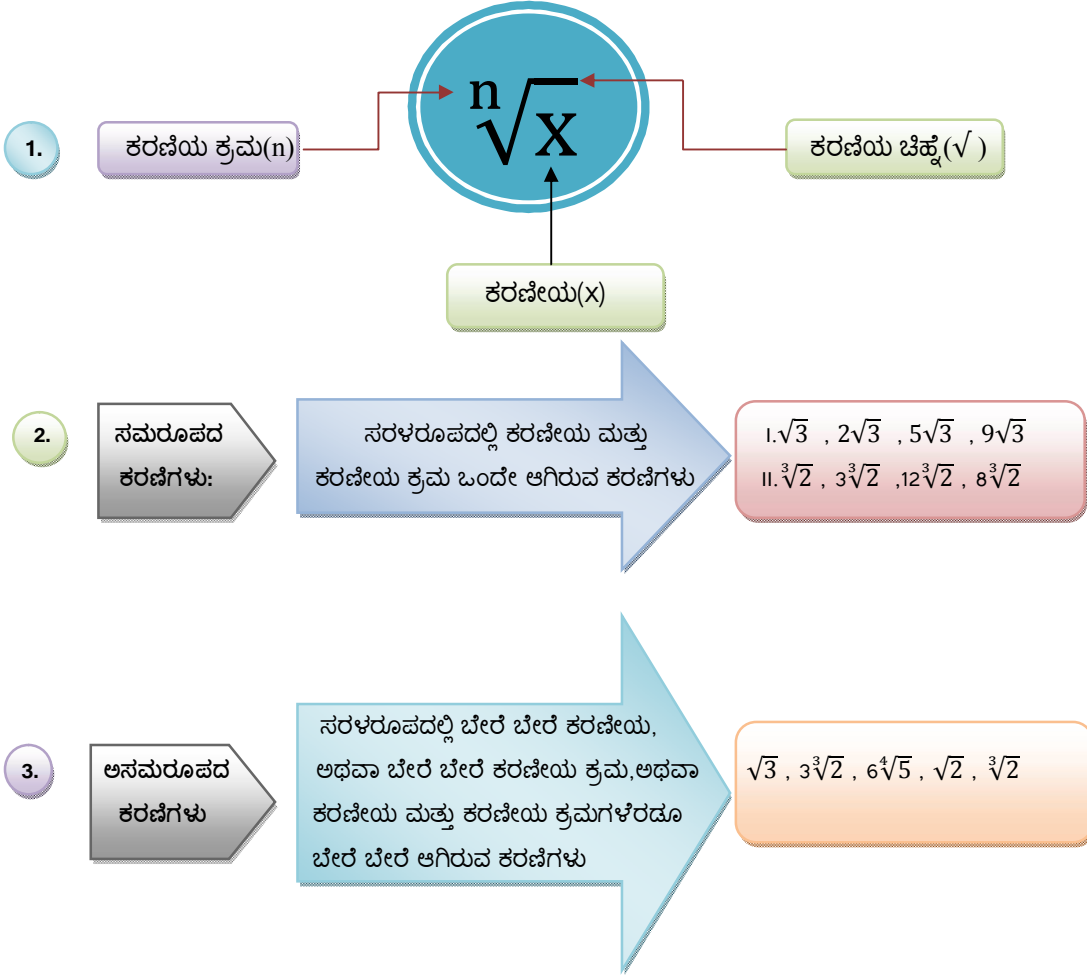


ಅಲ್-ಖೋವರಿಜ್ಮಿ

ಮುಖ್ಯ ವಿಷಯಗಳು



ಫಿಬೋನಾಸಿ



ಅಭ್ಯಾಸ 7.1

1. ಈ ಕೆಳಗಿನ ಕರಣಿಗಳನ್ನು ಸುಲಭರೂಪಕ್ಕೆ ತನ್ನಿ.

$$\begin{aligned} 1. & \sqrt{75} + \sqrt{108} - \sqrt{192} \\ &= \sqrt{25 \times 3} + \sqrt{36 \times 3} - \sqrt{64 \times 3} \\ &= 5\sqrt{3} + 6\sqrt{3} - 8\sqrt{3} \\ &= (5 + 6 - 8)\sqrt{3} \\ &= 3\sqrt{3} \end{aligned}$$

$$\begin{aligned} 2. & 4\sqrt{12} - \sqrt{50} - 7\sqrt{48} \\ &= 4\sqrt{4 \times 3} - \sqrt{25 \times 2} - 7\sqrt{16 \times 3} \end{aligned}$$

$$= 8\sqrt{3} - 5\sqrt{2} - 28\sqrt{3}$$

$$= -5\sqrt{2} - 20\sqrt{3}$$

$$= -5(\sqrt{2} + 4\sqrt{3})$$

3.  $\sqrt{45} - 3\sqrt{20} + 3\sqrt{5}$

$$= \sqrt{9 \times 5} - 3\sqrt{4 \times 5} + 3\sqrt{5}$$

$$= 3\sqrt{5} - 6\sqrt{5} + 3\sqrt{5}$$

$$= (3 - 6 + 3)\sqrt{5}$$

$$= 0 \times \sqrt{5}$$

$$= 0$$

4.  $2\sqrt{2a} + 3\sqrt{8a} - \sqrt{2a}$

$$= 2\sqrt{2a} + 3\sqrt{4 \times 2a} - \sqrt{2a}$$

$$= 2\sqrt{2a} + 6\sqrt{2a} - \sqrt{2a}$$

$$= (2 + 6 - 1)\sqrt{2a}$$

$$= 7\sqrt{2a}$$

5.  $3x\sqrt{x} + 3\sqrt{x^3} - 2\sqrt{9x^3}$

$$= 3x\sqrt{x} + 3\sqrt{x \cdot x^2} - 2\sqrt{x \cdot 9x^2}$$

$$= 3x\sqrt{x} + 3x\sqrt{x} - 6x\sqrt{x}$$

$$= (3x + 3x - 6x)\sqrt{x}$$

$$= (0)\sqrt{x}$$

$$= 0$$

6.  $\sqrt{12} + \sqrt{50} + 5\sqrt{3} - \sqrt{147} - \sqrt{32}$

$$= \sqrt{4 \times 3} + \sqrt{25 \times 2} + 5\sqrt{3} - \sqrt{49 \times 3} - \sqrt{16 \times 2}$$

$$= 2\sqrt{3} + 5\sqrt{2} + 5\sqrt{3} - 7\sqrt{3} - 4\sqrt{2}$$

$$= (2 + 5 - 7)\sqrt{3} + (5 - 4)\sqrt{2}$$

$$= (7 - 7)\sqrt{3} + (1)\sqrt{2}$$

$$= (0)\sqrt{3} + (1)\sqrt{2}$$

$$= 0 + \sqrt{2}$$

$$= \sqrt{2}$$

7.  $4\sqrt{7} - 3\sqrt{252} + 5\sqrt{343}$

$$= 4\sqrt{7} - 3\sqrt{36 \times 7} + 5\sqrt{49 \times 7}$$

$$= 4\sqrt{7} - 18\sqrt{7} + 35\sqrt{7}$$

$$= (4 - 18 + 35)\sqrt{7}$$

$$= (39 - 18)\sqrt{7}$$

$$= 21\sqrt{7}$$

8.  $\frac{1}{8}\sqrt{50} + \frac{1}{6}\sqrt{75} - \frac{1}{8}\sqrt{18} - \frac{1}{3}\sqrt{3}$

$$= \frac{1}{8}\sqrt{25 \times 2} + \frac{1}{6}\sqrt{25 \times 3} - \frac{1}{8}\sqrt{9 \times 2} - \frac{1}{3}\sqrt{3}$$

$$= \frac{5}{8}\sqrt{2} + \frac{5}{6}\sqrt{3} - \frac{3}{8}\sqrt{2} - \frac{1}{3}\sqrt{3}$$

$$= \left(\frac{5}{8} - \frac{3}{8}\right)\sqrt{2} + \left(\frac{5}{6} - \frac{1}{3}\right)\sqrt{3}$$

$$\begin{aligned}
 &= \left(\frac{5-3}{8}\right)\sqrt{2} + \left(\frac{5-2}{6}\right)\sqrt{3} \quad \leftarrow \left[\frac{1}{3} = \frac{2}{6}\right] \\
 &= \frac{2}{8}\sqrt{2} + \frac{3}{6}\sqrt{3} \\
 &= \frac{1}{4}\sqrt{2} + \frac{1}{2}\sqrt{3} \quad \left[\frac{2}{8} = \frac{1}{4}, \frac{3}{6} = \frac{1}{2}\right]
 \end{aligned}$$

II. ಈ ಕೆಳಗಿನ ಕರಣಿಗಳ ಮೊತ್ತವನ್ನು ಕಂಡುಹಿಡಿಯಿರಿ.

$$\begin{aligned}
 1. \quad &x\sqrt{y}, 2x\sqrt{y}, 4x\sqrt{y} \\
 &= x\sqrt{y} + 2x\sqrt{y} + 4x\sqrt{y} \\
 &= (x + 2x + 4x)\sqrt{y} \\
 &= 7x\sqrt{y}
 \end{aligned}$$

$$\begin{aligned}
 2. \quad &5^3\sqrt{p}, 3^3\sqrt{p}, 2^3\sqrt{p} \\
 &= 5^3\sqrt{p} + 3^3\sqrt{p} + 2^3\sqrt{p} \\
 &= (5 + 3 + 2)^3\sqrt{p} \\
 &= 10^3\sqrt{p}
 \end{aligned}$$

$$\begin{aligned}
 3. \quad &x\sqrt{x}, y\sqrt{y}, 3\sqrt{x^3}, 4\sqrt{y^3} \\
 &= x\sqrt{x} + y\sqrt{y} + 3\sqrt{x^3} + 4\sqrt{y^3} \\
 &= x\sqrt{x} + y\sqrt{y} + 3x\sqrt{x} + 4y\sqrt{y} \\
 &= (x + 3x)\sqrt{x} + (y + 4y)\sqrt{y} \\
 &= 4x\sqrt{x} + 5y\sqrt{y}
 \end{aligned}$$

$$\begin{aligned}
 4. \quad &(\sqrt{12} + \sqrt{20}), (3\sqrt{3} + 2\sqrt{5}), (\sqrt{45} - \sqrt{90}) \\
 &= (\sqrt{4x3} + \sqrt{4x5}), (3\sqrt{3} + 2\sqrt{5}), (\sqrt{9x5} - \sqrt{9x10}) \\
 &= 2\sqrt{3} + 2\sqrt{5} + 3\sqrt{3} + 2\sqrt{5} + 3\sqrt{5} - 3\sqrt{10} \\
 &= 2\sqrt{3} + 3\sqrt{3} + 2\sqrt{5} + 2\sqrt{5} + 3\sqrt{5} - 3\sqrt{10} \\
 &= (2 + 3)\sqrt{3} + (2 + 2 + 3)\sqrt{5} - 3\sqrt{10} \\
 &= 5\sqrt{3} + 7\sqrt{5} - 3\sqrt{10}
 \end{aligned}$$

$$\begin{aligned}
 5. \quad &(\sqrt{3} + \sqrt{2}), (2\sqrt{2} + 3\sqrt{3}), (4\sqrt{2} - 3\sqrt{3}) \\
 &= \sqrt{3} + \sqrt{2} + 2\sqrt{2} + 3\sqrt{3} + 4\sqrt{2} - 3\sqrt{3} \\
 &= \sqrt{2} + 2\sqrt{2} + 4\sqrt{2} + \sqrt{3} + 3\sqrt{3} - 3\sqrt{3} \\
 &= (1 + 2 + 4)\sqrt{2} + (1 + 3 - 3)\sqrt{3} \\
 &= (7\sqrt{2} + 1\sqrt{3}) \\
 &= 7\sqrt{2} + \sqrt{3}
 \end{aligned}$$

$$\begin{aligned}
 6. \quad &(\sqrt{x} + 2\sqrt{y}), (2\sqrt{x} - 3\sqrt{y}), (3\sqrt{x} + \sqrt{y}) \\
 &= \sqrt{x} + 2\sqrt{y} + 2\sqrt{x} - 3\sqrt{y} + 3\sqrt{x} + \sqrt{y} \\
 &= \sqrt{x} + 2\sqrt{x} + 3\sqrt{x} + 2\sqrt{y} - 3\sqrt{y} + \sqrt{y} \\
 &= (1 + 2 + 3)\sqrt{x} + (2 - 3 + 1)\sqrt{y} \\
 &= 6\sqrt{x} + 0\sqrt{y} \\
 &= 6\sqrt{x}
 \end{aligned}$$

III.

1.  $9\sqrt{x}$  ನಿಂದ  $5\sqrt{x}$  ನ್ನು ಕಳೆಯಿರಿ ಮತ್ತು ಫಲಿತಾಂಶವನ್ನು ಘಾತಾಂಕ ರೂಪದಲ್ಲಿಡಿ.

$$= 9\sqrt{x} - 5\sqrt{x}$$

$$= (9 - 5)\sqrt{x}$$

$$= 4\sqrt{x} \Rightarrow 4x^{\frac{1}{2}}$$

2.  $10\sqrt{p}$  ನಿಂದ  $3\sqrt{p}$  ಯನ್ನು ಕಳೆಯಿರಿ

$$= 10\sqrt{p} - 3\sqrt{p}$$

$$= (10 - 3)\sqrt{p}$$

$$= 7\sqrt{p}$$

3.  $3\sqrt{a}$  ಯನ್ನು  $4\sqrt{a}$  ಮತ್ತು  $2\sqrt{a}$  ಗಳ ಮೊತ್ತದಿಂದ ಕಳೆಯಿರಿ

$$= (4\sqrt{a} + 2\sqrt{a}) - 3\sqrt{a}$$

$$= 6\sqrt{a} - 3\sqrt{a}$$

$$= 3\sqrt{a}$$

4.  $2\sqrt{x} + 3\sqrt{y}$  ಯನ್ನು  $5\sqrt{x} - \sqrt{y}$  ಯಿಂದ ಕಳೆಯಿರಿ.

$$= (5\sqrt{x} - \sqrt{y}) - (2\sqrt{x} + 3\sqrt{y})$$

$$= 5\sqrt{x} - \sqrt{y} - 2\sqrt{x} - 3\sqrt{y}$$

$$= 5\sqrt{x} - 2\sqrt{x} - \sqrt{y} - 3\sqrt{y}$$

$$= (5 - 2)\sqrt{x} - (1 + 3)\sqrt{y}$$

$$= 3\sqrt{x} - 4\sqrt{y}$$

ಅಭ್ಯಾಸ 7.2

I. ಸುಲಭರೂಪಕ್ಕೆ ತನ್ನಿ

1.  $\sqrt{3} \times \sqrt{7}$

$$= \sqrt{21}$$

2.  $\sqrt[3]{4} \times \sqrt[3]{5}$

$$= \sqrt[3]{20}$$

3.  $\sqrt[4]{4} \times \sqrt[4]{6}$

$$= \sqrt[4]{24}$$

4.  $\sqrt[5]{10} \times \sqrt[5]{11}$

$$= \sqrt[5]{110}$$

5.  $\sqrt[6]{2} \times \sqrt[6]{5}$

$$= \sqrt[6]{10}$$

$$6. \sqrt[n]{x} \times \sqrt[n]{y}$$

$$= \sqrt[n]{xy}$$

$$7. 2^3\sqrt[3]{7} \times 3^3\sqrt[3]{4}$$

$$= 6^3\sqrt[3]{28}$$

$$8. \sqrt{18} \times \sqrt{27} \times \sqrt{128}$$

$$= \sqrt{9 \times 2} \times \sqrt{9 \times 3} \times \sqrt{64 \times 2}$$

$$= 3\sqrt{2} \times 3\sqrt{3} \times 8\sqrt{2}$$

$$= 3\sqrt{2} \times 3\sqrt{3} \times 8\sqrt{2}$$

$$= 72\sqrt{2}$$

II. ಕೆಳಗೆ ಕೊಟ್ಟಿರುವ ಕರಣಿಗಳ ಗುಣಲಬ್ಧ ಕಂಡುಹಿಡಿಯಿರಿ.

$$1. \sqrt{2} \text{ ಮತ್ತು } \sqrt[3]{4}$$

$$\sqrt{2} \times \sqrt[3]{4}$$

$$= \sqrt[3 \times 2]{2^3} \times \sqrt[2 \times 3]{4^2}$$

$$= \sqrt[6]{8} \times \sqrt[6]{16}$$

$$= \sqrt[6]{8 \times 16}$$

$$= \sqrt[6]{128}$$

$$2. \sqrt[3]{3} \text{ ಮತ್ತು } \sqrt[4]{2}$$

$$\sqrt[3]{3} \times \sqrt[4]{2}$$

$$= \sqrt[4 \times 3]{3^4} \times \sqrt[3 \times 4]{2^3}$$

$$= \sqrt[12]{81} \times \sqrt[12]{8}$$

$$= \sqrt[12]{81 \times 8}$$

$$= \sqrt[12]{648}$$

$$3. \sqrt[3]{5} \text{ ಮತ್ತು } \sqrt{2}$$

$$= \sqrt[3]{5} \times \sqrt{2}$$

$$= \sqrt[2 \times 3]{5^2} \times \sqrt[3 \times 2]{2^3}$$

$$= \sqrt[6]{25} \times \sqrt[6]{8}$$

$$= \sqrt[6]{200}$$

$$4. \sqrt{3} \text{ ಮತ್ತು } \sqrt[4]{5}$$

$$\sqrt{3} \times \sqrt[4]{5}$$

$$= \sqrt[2 \times 2]{3^2} \times \sqrt[4]{5}$$

$$= \sqrt[4]{9} \times \sqrt[4]{5}$$

$$= \sqrt[4]{9 \times 5}$$

$$= \sqrt[4]{45}$$

$$\begin{aligned}
 5. \quad & \sqrt{5} \text{ ಮತ್ತು } \sqrt[3]{3} \\
 & \sqrt{5} \times \sqrt[3]{3} \\
 & = {}^{3 \times 2}\sqrt{5^3} \times {}^{2 \times 3}\sqrt{3^2} \\
 & = \sqrt[6]{125} \times \sqrt[6]{9} \\
 & = \sqrt[6]{125 \times 9} \\
 & = \sqrt[6]{1125}
 \end{aligned}$$

$$\begin{aligned}
 6. \quad & \sqrt[3]{4} \text{ ಮತ್ತು } \sqrt[5]{2} \\
 & \sqrt[3]{4} \times \sqrt[5]{2} \\
 & = {}^{5 \times 3}\sqrt{4^5} \times {}^{3 \times 5}\sqrt{2^3} \\
 & = \sqrt[15]{4^5} \times \sqrt[15]{2^3} \\
 & = \sqrt[15]{1024} \times \sqrt[15]{8} \\
 & = \sqrt[15]{1024 \times 8} \\
 & = \sqrt[15]{8192}
 \end{aligned}$$

$$\begin{aligned}
 7. \quad & \sqrt[3]{5} \text{ ಮತ್ತು } \sqrt[4]{4} \\
 & = \sqrt[3]{5} \times \sqrt[4]{4} \\
 & = {}^{4 \times 3}\sqrt{5^4} \times {}^{3 \times 4}\sqrt{4^3} \\
 & = \sqrt[12]{625} \times \sqrt[12]{64} \\
 & = \sqrt[12]{625 \times 64} \\
 & = \sqrt[12]{40000}
 \end{aligned}$$

$$\begin{aligned}
 8. \quad & \sqrt[3]{2} \text{ ಮತ್ತು } \sqrt[6]{5} \\
 & = \sqrt[3]{2} \times \sqrt[6]{5} \\
 & = {}^{2 \times 3}\sqrt{2^2} \times \sqrt[6]{5} \\
 & = \sqrt[6]{4} \times \sqrt[6]{5} \\
 & = \sqrt[6]{20}
 \end{aligned}$$

III. ಕೆಳಗೆ ಕೊಟ್ಟಿರುವ ಕರಣಿಗಳ ಗುಣಲಬ್ಧ ಕಂಡುಹಿಡಿಯಿರಿ.

$$\begin{aligned}
 1. \quad & (3\sqrt{2} + 2\sqrt{3})(2\sqrt{3} - 4\sqrt{2}) \\
 & = (3\sqrt{2} + 2\sqrt{3})2\sqrt{3} - (3\sqrt{2} + 2\sqrt{3})4\sqrt{2} \\
 & = 3\sqrt{2} \times 2\sqrt{3} + 2\sqrt{3} \times 2\sqrt{3} - 3\sqrt{2} \times 4\sqrt{2} - 2\sqrt{3} \times 4\sqrt{2} \\
 & = 6\sqrt{6} + 4\sqrt{9} - 12\sqrt{4} - 8\sqrt{6} \\
 & = 6\sqrt{6} + 4 \times 3 - 12 \times 2 - 8\sqrt{6} \\
 & = 6\sqrt{6} + 12 - 24 - 8\sqrt{6} \\
 & = (6 - 8)\sqrt{6} - 12 \\
 & = -2\sqrt{6} - 12 \\
 & = -2(\sqrt{6} + 6)
 \end{aligned}$$

$$\begin{aligned}
 2. & (\sqrt{75} - \sqrt{45})(\sqrt{20} + \sqrt{12}) \\
 & = (\sqrt{75} - \sqrt{45})\sqrt{20} + (\sqrt{75} - \sqrt{45})\sqrt{12} \\
 & = \sqrt{75} \times \sqrt{20} - \sqrt{45} \times \sqrt{20} + \sqrt{75} \times \sqrt{12} - \sqrt{45} \times \sqrt{12} \\
 & = \sqrt{1500} - \sqrt{900} + \sqrt{900} - \sqrt{540} \\
 & = \sqrt{100 \times 15} - \sqrt{900} + \sqrt{900} - \sqrt{36 \times 15} \\
 & = 10\sqrt{15} - 30 + 30 - 6\sqrt{15} \\
 & = (10 - 6)\sqrt{15}
 \end{aligned}$$

$$= 4\sqrt{15}$$

$$\begin{aligned}
 3. & (3\sqrt{x} + 2\sqrt{y})(3\sqrt{y} - 2\sqrt{x}) \\
 & = (3\sqrt{x} + 2\sqrt{y})3\sqrt{y} - (3\sqrt{x} + 2\sqrt{y})2\sqrt{x} \\
 & = 3\sqrt{x} \times 3\sqrt{y} + 2\sqrt{y} \times 3\sqrt{y} - 3\sqrt{x} \times 2\sqrt{x} - 2\sqrt{y} \times 2\sqrt{x} \\
 & = 9\sqrt{xy} + 6\sqrt{y^2} - 6\sqrt{x^2} - 4\sqrt{xy} \\
 & = (9 - 4)\sqrt{xy} + 6y - 6x
 \end{aligned}$$

$$= 5\sqrt{xy} - 6x + 6y$$

$$\begin{aligned}
 4. & (6\sqrt{a} - 5\sqrt{b})(6\sqrt{a} + 5\sqrt{b}) \\
 & = (6\sqrt{a})^2 - (5\sqrt{b})^2 \quad \leftarrow [ \text{ನಿತ್ಯ ಸಮೀಕರಣ } (a - b)(a + b) = a^2 - b^2 ]
 \end{aligned}$$

$$= 36a - 25b$$

$$\begin{aligned}
 5. & (6\sqrt{2} - 7\sqrt{3})(6\sqrt{2} - 7\sqrt{3}) \\
 & = (6\sqrt{2} - 7\sqrt{3})^2 \quad \leftarrow [(a - b)(a - b) = (a - b)^2] \\
 & = (6\sqrt{2})^2 + (7\sqrt{3})^2 - 2 \cdot (6\sqrt{2})(7\sqrt{3}) \quad [ \text{ನಿತ್ಯ ಸಮೀಕರಣ } (a - b)^2 = a^2 + b^2 - 2ab ] \\
 & = 36 \times 2 + 49 \times 3 - 84\sqrt{6} \\
 & = 243 + 45\sqrt{3} + 63\sqrt{3} + 35 \\
 & = 278 + (45 + 63)\sqrt{3}
 \end{aligned}$$

$$= 278 + 108\sqrt{3}$$

### ಅಭ್ಯಾಸ 7.3

1. ಕೆಳಗಿನ ಕರಣಿಗಳ ಅಕರಣೀಕಾರಕಗಳನ್ನು ಬರೆಯಿರಿ.

1.  $\sqrt{a}$  ಯ ಅಕರಣೀಕಾರಕ  $\sqrt{a}$
1.  $2\sqrt{x}$  ಯ ಅಕರಣೀಕಾರಕ  $\sqrt{x}$
2.  $7\sqrt{y}$  ಯ ಅಕರಣೀಕಾರಕ  $\sqrt{y}$
3.  $\sqrt{xy}$  ಯ ಅಕರಣೀಕಾರಕ  $\sqrt{xy}$
4.  $4\sqrt{p+q}$  ಯ ಅಕರಣೀಕಾರಕ  $\sqrt{p+q}$
5.  $8\sqrt{x-y}$  ಯ ಅಕರಣೀಕಾರಕ  $\sqrt{x-y}$
6.  $\frac{1}{2}\sqrt{P}$  ಯ ಅಕರಣೀಕಾರಕ  $\sqrt{P}$
7.  $a\sqrt{ab}$  ಯ ಅಕರಣೀಕಾರಕ  $\sqrt{ab}$
8.  $x\sqrt{mn}$  ಯ ಅಕರಣೀಕಾರಕ  $\sqrt{mn}$
9.  $5p\sqrt{a+b}$  ಯ ಅಕರಣೀಕಾರಕ  $\sqrt{a+b}$



II. ಈ ಕೆಳಗಿನ ದ್ವಿಪದ ಕರಣಿಗಳಿಗೆ ಸಂಯುಗ್ಮಗಳನ್ನು ಬರೆಯಿರಿ.

1.  $\sqrt{a} + \sqrt{b}$  ಯ ಸಂಯುಗ್ಮ  $\sqrt{a} - \sqrt{b}$
2.  $\sqrt{x} - 2\sqrt{y}$  ಯ ಸಂಯುಗ್ಮ  $\sqrt{x} + 2\sqrt{y}$
3.  $3\sqrt{p} - 2\sqrt{q}$  ಯ ಸಂಯುಗ್ಮ  $3\sqrt{p} + 2\sqrt{q}$
4.  $\sqrt{x} + 3\sqrt{y}$  ಯ ಸಂಯುಗ್ಮ  $\sqrt{x} - 3\sqrt{y}$
5.  $10\sqrt{2} + 3\sqrt{5}$  ಯ ಸಂಯುಗ್ಮ  $10\sqrt{2} - 3\sqrt{5}$
6.  $5 + \sqrt{3}$  ಯ ಸಂಯುಗ್ಮ  $5 - \sqrt{3}$
7.  $\sqrt{8} - 5$  ಯ ಸಂಯುಗ್ಮ  $\sqrt{8} + 5$
8.  $3\sqrt{7} + 7\sqrt{3}$  ಯ ಸಂಯುಗ್ಮ  $3\sqrt{7} - 7\sqrt{3}$
9.  $\frac{1}{2} + \sqrt{2}$  ಯ ಸಂಯುಗ್ಮ  $\frac{1}{2} - \sqrt{2}$
10.  $\frac{1}{2}x + \frac{1}{2}\sqrt{y}$  ಯ ಸಂಯುಗ್ಮ  $\frac{1}{2}x - \frac{1}{2}\sqrt{y}$
11.  $x\sqrt{a} + y\sqrt{b}$  ಯ ಸಂಯುಗ್ಮ  $x\sqrt{a} - y\sqrt{b}$
12.  $xy\sqrt{z} + yz\sqrt{x}$  ಯ ಸಂಯುಗ್ಮ  $xy\sqrt{z} - yz\sqrt{x}$

III. ಕೆಳಗಿನ ಪ್ರತಿಯೊಂದಕ್ಕೂ ಅಕರಣೀಕಾರಕವನ್ನು ಹಿಡಿಯಿರಿ.

1.  $2^{\frac{1}{3}} + 2^{-\frac{1}{3}}$

$x = 2^{\frac{1}{3}}$  ಮತ್ತು  $y = 2^{-\frac{1}{3}}$

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

$x^3 + y^3 = 2^{\frac{1 \times 3}{3}} + 2^{-\frac{1 \times 3}{3}}$

$x^3 + y^3 = 2^1 + 2^{-1}$

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

$x^3 + y^3 = \frac{4+1}{2}$

$x^3 + y^3 = \frac{5}{2}$

ಹಾಗೆಯೇ,

$x^3 + y^3 = (x + y)(x^2 - xy + y^2)$

$\frac{5}{2} = \left(2^{\frac{1}{3}} + 2^{-\frac{1}{3}}\right) \left[\left(2^{\frac{1}{3}}\right)^2 - 2^{\frac{1}{3}} \times 2^{-\frac{1}{3}} + \left(2^{-\frac{1}{3}}\right)^2\right]$

$\frac{5}{2} = \left(2^{\frac{1}{3}} + 2^{-\frac{1}{3}}\right) \left[2^{\frac{2}{3}} - 2^{\frac{0}{3}} + 2^{-\frac{2}{3}}\right]$

$\frac{5}{2} = \left(2^{\frac{1}{3}} + 2^{-\frac{1}{3}}\right) \left[2^{\frac{2}{3}} - 1 + 2^{-\frac{2}{3}}\right]$

$\therefore \left(2^{\frac{1}{3}} + 2^{-\frac{1}{3}}\right)$ ರ ಅಕರಣೀಕಾರಕ  $\left[2^{\frac{2}{3}} - 1 + 2^{-\frac{2}{3}}\right]$

2.

$$5^{\frac{1}{3}} + 5^{-\frac{1}{3}}$$

$$x = 5^{\frac{1}{3}} \text{ ಮತ್ತು } y = 5^{-\frac{1}{3}}$$

$$x^3 + y^3 = \left(5^{\frac{1}{3}}\right)^3 + \left(5^{-\frac{1}{3}}\right)^3$$

$$x^3 + y^3 = 5^{\frac{1 \times 3}{3}} + 5^{-\frac{1 \times 3}{3}}$$

$$x^3 + y^3 = 5^1 + 5^{-1}$$

$$x^3 + y^3 = 5 + \frac{1}{5}$$

$$x^3 + y^3 = \frac{25+1}{5}$$

$$x^3 + y^3 = \frac{26}{5}$$

ಹಾಗೆಯೇ,

$$x^3 + y^3 = (x + y)(x^2 - xy + y^2)$$

$$\frac{26}{5} = \left(5^{\frac{1}{3}} + 5^{-\frac{1}{3}}\right) \left[\left(5^{\frac{1}{3}}\right)^2 - 5^{\frac{1}{3}} \times 5^{-\frac{1}{3}} + \left(5^{-\frac{1}{3}}\right)^2\right]$$

$$\frac{26}{5} = \left(5^{\frac{1}{3}} + 5^{-\frac{1}{3}}\right) \left[5^{\frac{2}{3}} - 5^0 + 5^{-\frac{2}{3}}\right]$$

$$\frac{26}{5} = \left(5^{\frac{1}{3}} + 5^{-\frac{1}{3}}\right) \left[5^{\frac{2}{3}} - 1 + 5^{-\frac{2}{3}}\right]$$

$$\therefore \left(5^{\frac{1}{3}} + 5^{-\frac{1}{3}}\right) \text{ ರ ಅಕರಣೀಕಾರಕ } \left[5^{\frac{2}{3}} - 1 + 5^{-\frac{2}{3}}\right]$$

3.  $(\sqrt{1+y} - \sqrt{1-y})$

$$(\sqrt{1+y} - \sqrt{1-y})(\sqrt{1+y} + \sqrt{1-y})$$

$$(\sqrt{1+y})^2 - (\sqrt{1-y})^2$$

$$(1+y) - (1-y)$$

$$1+y - 1+y$$

$$2y$$

$$\therefore (\sqrt{1+y} - \sqrt{1-y}) \text{ ರ ಅಕರಣೀಕಾರಕ } (\sqrt{1+y} + \sqrt{1-y})$$

#### ಅಭ್ಯಾಸ 7.4

1. ಛೇದವನ್ನು ಅಕರಣೀಕರಿಸಿ ಸುಲಭರೂಪಕ್ಕೆ ತನ್ನಿ:

A.

$$1. \frac{8}{\sqrt{3}}$$

$$\Rightarrow \frac{8}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}}$$

$$= \frac{8\sqrt{3}}{(\sqrt{3})^2}$$

$$= \frac{8\sqrt{3}}{3}$$

$$2. \frac{3}{2\sqrt{x}}$$

$$\Rightarrow \frac{3}{2\sqrt{x}} \times \frac{\sqrt{x}}{\sqrt{x}}$$

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

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

3.  $\sqrt{\frac{5}{2y}}$

$$\Rightarrow \frac{\sqrt{5}}{\sqrt{2y}}$$

$$= \frac{\sqrt{5}}{\sqrt{2y}} \times \frac{\sqrt{2y}}{\sqrt{2y}}$$

$$= \frac{\sqrt{10y}}{2y}$$

4.  $\frac{1}{2}\sqrt{\frac{2a}{5}}$

$$\Rightarrow \frac{1}{2} \frac{\sqrt{2a}}{\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}}$$

$$= \frac{1}{2} \times \frac{\sqrt{10a}}{(\sqrt{5})^2}$$

$$= \frac{\sqrt{10a}}{2 \times 5}$$

$$= \frac{\sqrt{10a}}{10}$$

5.  $\frac{3\sqrt{5}}{\sqrt{6}}$

$$\Rightarrow \frac{3\sqrt{5}}{\sqrt{6}} \times \frac{\sqrt{6}}{\sqrt{6}}$$

$$= \frac{3\sqrt{30}}{(\sqrt{6})^2}$$

$$= \frac{3\sqrt{30}}{6}$$

$$= \frac{\sqrt{30}}{2}$$

B. 1.  $\frac{2}{\sqrt{3}+\sqrt{2}}$

$$\Rightarrow \frac{2}{\sqrt{3}+\sqrt{2}} \times \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}-\sqrt{2}}$$

$$= \frac{2(\sqrt{3}-\sqrt{2})}{(\sqrt{3})^2 - (\sqrt{2})^2}$$

$$= \frac{2(\sqrt{3}-\sqrt{2})}{3-2}$$

$$= \frac{2(\sqrt{3}-\sqrt{2})}{1}$$

$$= 2(\sqrt{3} - \sqrt{2})$$

$$\begin{aligned}
 2. \quad & \frac{x}{\sqrt{x}-\sqrt{y}} \\
 & \Rightarrow \frac{x}{\sqrt{x}-\sqrt{y}} \times \frac{\sqrt{x}+\sqrt{y}}{\sqrt{x}+\sqrt{y}} \\
 & = \frac{x(\sqrt{x}+\sqrt{y})}{(\sqrt{x})^2-(\sqrt{y})^2} \\
 & = \frac{x(\sqrt{x}+\sqrt{y})}{x-y}
 \end{aligned}$$

$$\begin{aligned}
 3. \quad & \frac{\sqrt{10}}{\sqrt{5}+\sqrt{3}} \\
 & \Rightarrow \frac{\sqrt{10}}{\sqrt{5}+\sqrt{3}} \times \frac{\sqrt{5}-\sqrt{3}}{\sqrt{5}-\sqrt{3}} \\
 & = \frac{\sqrt{10}(\sqrt{5}-\sqrt{3})}{(\sqrt{5})^2-(\sqrt{3})^2} \\
 & = \frac{\sqrt{10}(\sqrt{5}-\sqrt{3})}{5-3} \\
 & = \frac{\sqrt{10}(\sqrt{5}-\sqrt{3})}{2} \\
 & = \frac{\sqrt{25 \times 2} - \sqrt{30}}{2} \\
 & = \frac{5\sqrt{2} - \sqrt{30}}{2}
 \end{aligned}$$

$$\begin{aligned}
 4. \quad & \frac{3\sqrt{5}}{\sqrt{6}-\sqrt{3}} \\
 & \Rightarrow \frac{3\sqrt{5}}{\sqrt{6}-\sqrt{3}} \times \frac{\sqrt{6}+\sqrt{3}}{\sqrt{6}+\sqrt{3}} \\
 & = \frac{3\sqrt{5}(\sqrt{6}+\sqrt{3})}{(\sqrt{6})^2-(\sqrt{3})^2} \\
 & = \frac{3\sqrt{5}(\sqrt{6}+\sqrt{3})}{6-3} \\
 & = \frac{3\sqrt{5}(\sqrt{6}+\sqrt{3})}{3} \\
 & = \sqrt{5}(\sqrt{6}+\sqrt{3})
 \end{aligned}$$

$$\begin{aligned}
 5. \quad & \frac{\sqrt{ab}}{\sqrt{a}-\sqrt{b}} \\
 & \Rightarrow \frac{\sqrt{ab}}{\sqrt{a}-\sqrt{b}} \times \frac{\sqrt{a}+\sqrt{b}}{\sqrt{a}+\sqrt{b}} \\
 & = \frac{\sqrt{ab}(\sqrt{a}+\sqrt{b})}{(\sqrt{a})^2-(\sqrt{b})^2} \\
 & = \frac{\sqrt{ab}(\sqrt{a}+\sqrt{b})}{a-b}
 \end{aligned}$$

OR

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

C. 1.  $\frac{\sqrt{3} + \sqrt{2}}{\sqrt{3} - \sqrt{2}}$

$$\begin{aligned} &\Rightarrow \frac{\sqrt{3} + \sqrt{2}}{\sqrt{3} - \sqrt{2}} \times \frac{\sqrt{3} + \sqrt{2}}{\sqrt{3} + \sqrt{2}} \\ &= \frac{(\sqrt{3} + \sqrt{2})(\sqrt{3} + \sqrt{2})}{(\sqrt{3})^2 - (\sqrt{2})^2} \\ &= \frac{(\sqrt{3} + \sqrt{2})^2}{3 - 2} \\ &= \frac{(\sqrt{3})^2 + (\sqrt{2})^2 + 2 \cdot \sqrt{3} \cdot \sqrt{2}}{3 - 2} \quad [\text{ನಿತ್ಯ ಸಮೀಕರಣ } (a + b)^2 = a^2 + b^2 + 2ab] \\ &= \frac{3 + 2 + 2\sqrt{6}}{1} \\ &= \mathbf{5 + 2\sqrt{6}} \end{aligned}$$

2.  $\frac{5\sqrt{2} - \sqrt{3}}{3\sqrt{2} - \sqrt{5}}$

$$\begin{aligned} &\Rightarrow \frac{5\sqrt{2} - \sqrt{3}}{3\sqrt{2} - \sqrt{5}} \times \frac{3\sqrt{2} + \sqrt{5}}{3\sqrt{2} + \sqrt{5}} \\ &= \frac{(5\sqrt{2} - \sqrt{3})(3\sqrt{2} + \sqrt{5})}{(3\sqrt{2})^2 - (\sqrt{5})^2} \\ &= \frac{5\sqrt{2} \times 3\sqrt{2} - \sqrt{3} \times 3\sqrt{2} + 5\sqrt{2} \times \sqrt{5} - \sqrt{3} \times \sqrt{5}}{9 \times 2 - 5} \\ &= \frac{15\sqrt{4} - 3\sqrt{6} + 5\sqrt{10} - \sqrt{15}}{18 - 5} \\ &= \frac{15 \times 2 - 3\sqrt{6} + 5\sqrt{10} - \sqrt{15}}{13} \\ &= \mathbf{\frac{30 - 3\sqrt{6} + 5\sqrt{10} - \sqrt{15}}{13}} \end{aligned}$$

3.  $\frac{4\sqrt{3} + \sqrt{2}}{\sqrt{3} + \sqrt{2}}$

$$\begin{aligned} &\Rightarrow \frac{4\sqrt{3} + \sqrt{2}}{\sqrt{3} + \sqrt{2}} \times \frac{\sqrt{3} - \sqrt{2}}{\sqrt{3} - \sqrt{2}} \\ &= \frac{(4\sqrt{3} + \sqrt{2})(\sqrt{3} - \sqrt{2})}{(\sqrt{3})^2 - (\sqrt{2})^2} \\ &= \frac{4\sqrt{3} \times \sqrt{3} + \sqrt{2} \times \sqrt{3} - 4\sqrt{3} \times \sqrt{2} - \sqrt{2} \times \sqrt{2}}{3 - 2} \\ &= \frac{4\sqrt{9} + \sqrt{6} - 4\sqrt{6} - \sqrt{4}}{1} \\ &= 4 \times 3 + (1 - 4)\sqrt{6} - 2 \\ &= 12 - 2 + 3\sqrt{6} \\ &= \mathbf{10 + 3\sqrt{6}} \end{aligned}$$

4.  $\frac{3 + \sqrt{6}}{\sqrt{3} + 6}$

$$\Rightarrow \frac{3 + \sqrt{6}}{\sqrt{3} + 6} \times \frac{\sqrt{3} - 6}{\sqrt{3} - 6}$$

$$\begin{aligned}
 &= \frac{3\sqrt{3} + \sqrt{6} \times \sqrt{3} - 3 \times 6 - \sqrt{6} \times 6}{(\sqrt{3})^2 - 6^2} \\
 &= \frac{3\sqrt{3} + \sqrt{18} - 18 - 6\sqrt{6}}{3 - 36} \\
 &= \frac{3\sqrt{3} + \sqrt{9 \times 2} - 18 - 6\sqrt{6}}{-33} \\
 &= \frac{3\sqrt{3} + 3\sqrt{2} - 18 - 6\sqrt{6}}{-33} \\
 &= \frac{-3(\sqrt{3} + \sqrt{2} - 6 - 2\sqrt{6})}{33} \\
 &= \frac{-(\sqrt{3} + \sqrt{2} - 6 - 2\sqrt{6})}{11}
 \end{aligned}$$

II. ಸಂಕ್ಷೇಪಿಸಿ.

$$\begin{aligned}
 1. & \frac{\sqrt{2}}{\sqrt{3}-\sqrt{2}} + \frac{\sqrt{5}}{\sqrt{3}+\sqrt{2}} \\
 & \Rightarrow \frac{\sqrt{2}}{\sqrt{3}-\sqrt{2}} \times \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}+\sqrt{2}} + \frac{\sqrt{5}}{\sqrt{3}+\sqrt{2}} \times \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}-\sqrt{2}} \\
 & = \frac{\sqrt{2}(\sqrt{3}+\sqrt{2})}{(\sqrt{3})^2 - (\sqrt{2})^2} + \frac{\sqrt{5}(\sqrt{3}-\sqrt{2})}{(\sqrt{3})^2 - (\sqrt{2})^2} \\
 & = \frac{\sqrt{6} + \sqrt{4}}{3-2} + \frac{\sqrt{15} - \sqrt{10}}{3-2} \\
 & = \frac{\sqrt{6} + 2}{1} + \frac{\sqrt{15} - \sqrt{10}}{1} \\
 & = 2 + \sqrt{6} + \sqrt{15} - \sqrt{10}
 \end{aligned}$$

$$\begin{aligned}
 2. & \frac{\sqrt{5}}{\sqrt{5}-\sqrt{3}} + \frac{\sqrt{3}}{\sqrt{5}+\sqrt{3}} \\
 & \Rightarrow \frac{\sqrt{5}}{\sqrt{5}-\sqrt{3}} \times \frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}+\sqrt{3}} + \frac{\sqrt{3}}{\sqrt{5}+\sqrt{3}} \times \frac{\sqrt{5}-\sqrt{3}}{\sqrt{5}-\sqrt{3}} \\
 & = \frac{\sqrt{5}(\sqrt{5}+\sqrt{3})}{(\sqrt{5})^2 - (\sqrt{3})^2} + \frac{\sqrt{3}(\sqrt{5}-\sqrt{3})}{(\sqrt{5})^2 - (\sqrt{3})^2} \\
 & = \frac{\sqrt{25} + \sqrt{15}}{5-3} + \frac{\sqrt{15} - \sqrt{9}}{5-3} \\
 & = \frac{5 + \sqrt{15}}{2} + \frac{\sqrt{15} - 3}{2} \\
 & = \frac{5-3 + \sqrt{15} + \sqrt{15}}{2} \\
 & = \frac{8 + 2\sqrt{15}}{2} \\
 & = \frac{2(4 + \sqrt{15})}{2} \\
 & = 4 + \sqrt{15}
 \end{aligned}$$

$$3. \frac{\sqrt{6}}{\sqrt{5}} + \frac{2}{\sqrt{5} + \sqrt{2}}$$

$$\begin{aligned} &\Rightarrow \frac{\sqrt{6}}{\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}} + \frac{2}{\sqrt{5}+\sqrt{2}} \times \frac{\sqrt{5}-\sqrt{2}}{\sqrt{5}-\sqrt{2}} \\ &= \frac{\sqrt{30}}{(\sqrt{5})^2} + \frac{2(\sqrt{5}-\sqrt{2})}{(\sqrt{5})^2 - (\sqrt{2})^2} \\ &= \frac{\sqrt{30}}{5} + \frac{2(\sqrt{5}-\sqrt{2})}{5-2} \\ &= \frac{\sqrt{30}}{5} + \frac{2(\sqrt{5}-\sqrt{2})}{3} \\ &= \frac{3\sqrt{30} + 10(\sqrt{5}-\sqrt{2})}{15} \end{aligned}$$

4.  $\frac{7\sqrt{3}}{\sqrt{6}-\sqrt{3}} + \frac{2\sqrt{5}}{\sqrt{8}+\sqrt{2}}$

$$\begin{aligned} &\Rightarrow \frac{7\sqrt{3}}{\sqrt{6}-\sqrt{3}} \times \frac{\sqrt{6}+\sqrt{3}}{\sqrt{6}+\sqrt{3}} + \frac{2\sqrt{5}}{\sqrt{8}+\sqrt{2}} \times \frac{\sqrt{8}-\sqrt{2}}{\sqrt{8}-\sqrt{2}} \\ &= \frac{7\sqrt{3}(\sqrt{6}+\sqrt{3})}{(\sqrt{6})^2 - (\sqrt{3})^2} + \frac{2\sqrt{5}(\sqrt{8}-\sqrt{2})}{(\sqrt{8})^2 - (\sqrt{2})^2} \\ &= \frac{7\sqrt{18} + 7\sqrt{9}}{6-3} + \frac{2\sqrt{40} - 2\sqrt{10}}{8-2} \\ &= \frac{7\sqrt{9 \times 2} + 7\sqrt{9}}{3} + \frac{2\sqrt{4 \times 10} - 2\sqrt{10}}{6} \\ &= \frac{21\sqrt{2} + 21}{3} + \frac{4\sqrt{10} - 2\sqrt{10}}{6} \\ &= \frac{21(\sqrt{2} + 1)}{3} + \frac{2(2\sqrt{10} - \sqrt{10})}{6} \\ &= \frac{21(\sqrt{2} + 1)}{3} + \frac{\sqrt{10}}{3} \\ &= \frac{21(\sqrt{2} + 1) + \sqrt{10}}{3} \end{aligned}$$

5.  $\frac{\sqrt{21}}{\sqrt{3}+\sqrt{7}} + \frac{2\sqrt{5}}{\sqrt{21}+\sqrt{5}}$

$$\begin{aligned} &\Rightarrow \frac{\sqrt{21}}{\sqrt{3}+\sqrt{7}} \times \frac{\sqrt{3}-\sqrt{7}}{\sqrt{3}-\sqrt{7}} + \frac{2\sqrt{5}}{\sqrt{21}+\sqrt{5}} \times \frac{\sqrt{21}-\sqrt{5}}{\sqrt{21}-\sqrt{5}} \\ &= \frac{\sqrt{21}(\sqrt{3}-\sqrt{7})}{(\sqrt{3})^2 - (\sqrt{7})^2} + \frac{2\sqrt{5}(\sqrt{21}-\sqrt{5})}{(\sqrt{21})^2 - (\sqrt{5})^2} \\ &= \frac{\sqrt{63} - \sqrt{147}}{3-7} + \frac{2\sqrt{105} + 2\sqrt{25}}{21-5} \\ &= \frac{\sqrt{9 \times 7} - \sqrt{49 \times 3}}{-4} + \frac{2\sqrt{105} - 10}{16} \\ &= \frac{7\sqrt{3} - 3\sqrt{7}}{4} + \frac{2(\sqrt{105} - 5)}{16} \\ &= \frac{14\sqrt{3} - 6\sqrt{7} + \sqrt{105} - 5}{8} \end{aligned}$$

6.  $x = 2\sqrt{6} + 5$  ಆದರೆ  $x + \frac{1}{x}$  ಬೆಲೆಯನ್ನು ಕಂಡುಹಿಡಿಯಿರಿ.

$$x + \frac{1}{x} = 2\sqrt{6} + 5 + \frac{1}{2\sqrt{6} + 5}$$

$$x + \frac{1}{x} = \frac{(2\sqrt{6} + 5)2 + 1}{2\sqrt{6} + 5}$$

$$x + \frac{1}{x} = \frac{4\sqrt{6} + 10 + 1}{2\sqrt{6} + 5}$$

$$x + \frac{1}{x} = \frac{4\sqrt{6} + 11}{2\sqrt{6} + 5} \times \frac{2\sqrt{6} - 5}{2\sqrt{6} - 5}$$

$$x + \frac{1}{x} = \frac{(4\sqrt{6} + 11)(2\sqrt{6} - 5)}{(2\sqrt{6})^2 - 5^2}$$

$$x + \frac{1}{x} = \frac{8\sqrt{36} + 22\sqrt{6} - 20\sqrt{6} - 55}{4 \times 6 - 25}$$

$$x + \frac{1}{x} = \frac{8 \times 6 + 22\sqrt{6} - 20\sqrt{6} - 55}{24 - 25}$$

$$x + \frac{1}{x} = \frac{48 + 2\sqrt{6} - 55}{-1}$$

$$x + \frac{1}{x} = \frac{2\sqrt{6} - 5}{-1}$$

$$x + \frac{1}{x} = 5 - 2\sqrt{6}$$

$$x + \frac{1}{x} = 2\sqrt{6} + 5 + \frac{1}{2\sqrt{6} + 5} \times \frac{2\sqrt{6} - 5}{2\sqrt{6} - 5}$$

$$x + \frac{1}{x} = 2\sqrt{6} + 5 + \frac{2\sqrt{6} - 5}{(2\sqrt{6})^2 - 5^2}$$

$$x + \frac{1}{x} = 2\sqrt{6} + 5 + \frac{2\sqrt{6} - 5}{4 \times 6 - 25}$$

$$x + \frac{1}{x} = 2\sqrt{6} + 5 + \frac{2\sqrt{6} - 5}{-1}$$

$$x + \frac{1}{x} = 2\sqrt{6} + 5 + \frac{5 - 2\sqrt{6}}{1}$$

$$x + \frac{1}{x} = 2\sqrt{6} + 5 + 5 - 2\sqrt{6}$$

$$x + \frac{1}{x} = 10$$

III. x ನ ಬೆಲೆಯನ್ನು ಕಂಡುಹಿಡಿಯಿರಿ.

$$1. \frac{3x-4}{\sqrt{3x+2}} = 2 + \frac{\sqrt{3x}-2}{2}$$

$$\Rightarrow \frac{3x-4}{\sqrt{3x+2}} - \frac{(\sqrt{3x}-2)}{2} = 2$$

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

$$\Rightarrow \frac{(\sqrt{3x}+2)(\sqrt{3x}-2)}{\sqrt{3x+2}} - \frac{(\sqrt{3x}-2)}{2} = 2 \quad [ a^2 - b^2 = (a+b)(a-b) ]$$



$$\Rightarrow \frac{(\sqrt{3x}-2)}{1} - \frac{(\sqrt{3x}-2)}{2} = 2$$

$$\Rightarrow 2(\sqrt{3x}-2) - (\sqrt{3x}-2) = 4 \quad [\text{ಎರಡರಿಂದ ಗುಣಿಸಿದಾಗ}]$$

$$\Rightarrow 2\sqrt{3x} - 4 - \sqrt{3x} + 2 = 4$$

$$\Rightarrow \sqrt{3x} - 2 = 4$$

$$\Rightarrow \sqrt{3x} = 6$$

$$\Rightarrow 3x = 36 \quad [\text{ಎರಡೂ ಕಡೆ ವರ್ಗ ಮಾಡಿದಾಗ}]$$

$$\Rightarrow x = 12$$

2.  $\frac{x-1}{\sqrt{x}+1} = 4 + \frac{\sqrt{x}-1}{2}$

$$\Rightarrow \frac{x-1}{\sqrt{x}+1} - \frac{(\sqrt{x}-1)}{2} = 4$$

$$\Rightarrow \frac{(\sqrt{x})^2-1}{\sqrt{x}+1} - \frac{(\sqrt{x}-1)}{2} = 4$$

$$\Rightarrow \frac{(\sqrt{x}+1)(\sqrt{x}-1)}{\sqrt{x}+1} - \frac{(\sqrt{x}-1)}{2} = 4$$

$$\Rightarrow \frac{(\sqrt{x}-1)}{1} - \frac{(\sqrt{x}-1)}{2} = 4$$

$$\Rightarrow 2(\sqrt{x}-1) - (\sqrt{x}-1) = 4 \times 2$$

$$\Rightarrow 2\sqrt{x} - 2 - \sqrt{x} + 1 = 8$$

$$\Rightarrow \sqrt{x} - 1 = 8$$

$$\Rightarrow \sqrt{x} = 9$$

$$\Rightarrow x = 81$$

[ಎರಡೂ ಕಡೆ ವರ್ಗ ಮಾಡಿದಾಗ]