

Giải bài tập 62 trang 33 SGK toán đại số lớp 9 tập 1

Đáp án:

Rút gọn các biểu thức sau:

$$a) \frac{1}{2}\sqrt{48} - 2\sqrt{75} - \frac{\sqrt{33}}{\sqrt{11}} + 5\sqrt{1\frac{1}{3}};$$

$$b) \sqrt{150} + \sqrt{1,6} \cdot \sqrt{60} + 4,5 \cdot \sqrt{2\frac{2}{3}} - \sqrt{6};$$

$$c) (\sqrt{28} - 2\sqrt{3} + \sqrt{7})\sqrt{7} + \sqrt{48};$$

$$d) (\sqrt{6} + \sqrt{5})^2 - \sqrt{120}.$$

Đáp án:

- Cách 1:

a) Ta có:

$$\begin{aligned}
& \frac{1}{2}\sqrt{48} - 2\sqrt{75} - \frac{\sqrt{33}}{\sqrt{11}} + 5\sqrt{1\frac{1}{3}} \\
&= \frac{1}{2}\sqrt{16 \cdot 3} - 2\sqrt{25 \cdot 3} - \frac{\sqrt{3 \cdot 11}}{\sqrt{11}} + 5\sqrt{\frac{1 \cdot 3 + 1}{3}} \\
&= \frac{1}{2}\sqrt{4^2 \cdot 3} - 2\sqrt{5^2 \cdot 3} - \frac{\sqrt{3} \cdot \sqrt{11}}{\sqrt{11}} + 5\sqrt{\frac{4}{3}} \\
&= \frac{1}{2} \cdot 4\sqrt{3} - 2 \cdot 5\sqrt{3} - \sqrt{3} + 5 \frac{\sqrt{4}}{\sqrt{3}} \\
&= \frac{4}{2}\sqrt{3} - 10\sqrt{3} - \sqrt{3} + 5 \frac{\sqrt{4} \cdot \sqrt{3}}{\sqrt{3} \cdot \sqrt{3}} \\
&= 2\sqrt{3} - 10\sqrt{3} - \sqrt{3} + 5 \frac{2\sqrt{3}}{3} \\
&= 2\sqrt{3} - 10\sqrt{3} - \sqrt{3} + 10 \frac{\sqrt{3}}{3} \\
&= \left(2 - 10 - 1 + \frac{10}{3}\right) \sqrt{3} \\
&= -\frac{17}{3}.
\end{aligned}$$

b) Ta có:

$$\begin{aligned}
& \sqrt{150} + \sqrt{1,6} \cdot \sqrt{60} + 4,5 \cdot \sqrt{2\frac{2}{3}} - \sqrt{6} \\
&= \sqrt{25 \cdot 6} + \sqrt{1,6 \cdot 60} + 4,5 \cdot \sqrt{\frac{2 \cdot 3 + 2}{3}} - \sqrt{6} \\
&= \sqrt{5^2 \cdot 6} + \sqrt{1,6 \cdot (6 \cdot 10)} + 4,5 \sqrt{\frac{8}{3}} - \sqrt{6} \\
&= 5\sqrt{6} + \sqrt{(1,6 \cdot 10) \cdot 6} + 4,5 \frac{\sqrt{8}}{\sqrt{3}} - \sqrt{6} \\
&= 5\sqrt{6} + \sqrt{16 \cdot 6} + 4,5 \frac{\sqrt{8} \cdot \sqrt{3}}{3} - \sqrt{6} \\
&= 5\sqrt{6} + \sqrt{4^2 \cdot 6} + 4,5 \frac{\sqrt{8 \cdot 3}}{3} - \sqrt{6} \\
&= 5\sqrt{6} + 4\sqrt{6} + 4,5 \cdot \frac{\sqrt{4 \cdot 2 \cdot 3}}{3} - \sqrt{6} \\
&= 5\sqrt{6} + 4\sqrt{6} + 4,5 \cdot \frac{\sqrt{2^2 \cdot 6}}{3} - \sqrt{6} \\
&= 5\sqrt{6} + 4\sqrt{6} + 4,5 \cdot 2 \frac{\sqrt{6}}{3} - \sqrt{6} \\
&= 5\sqrt{6} + 4\sqrt{6} + 9 \frac{\sqrt{6}}{3} - \sqrt{6} \\
&= 5\sqrt{6} + 4\sqrt{6} + 3\sqrt{6} - \sqrt{6} \\
&= (5 + 4 + 3 - 1)\sqrt{6} = 11\sqrt{6}.
\end{aligned}$$

- **Cách 2:** Ta biến đổi từng hạng tử rồi thay vào các biểu thức ban đầu

$$+ \sqrt{150} = \sqrt{25 \cdot 6} = 5\sqrt{6}$$

$$+ \sqrt{1,6 \cdot 60} = \sqrt{1,6 \cdot (10 \cdot 6)} = \sqrt{(1,6 \cdot 10) \cdot 6} = \sqrt{16 \cdot 6} \\ = 4\sqrt{6}$$

$$+ 4,5 \cdot \sqrt{2\frac{2}{3}} = 4,5 \cdot \sqrt{\frac{2 \cdot 3 + 2}{3}} = 4,5 \cdot \sqrt{\frac{8}{3}} = 4,5 \frac{8 \cdot 3}{3}$$

$$= 4,5 \cdot \frac{\sqrt{4 \cdot 2 \cdot 3}}{3} = 4,5 \cdot \frac{2 \cdot \sqrt{6}}{3} = 9 \cdot \frac{\sqrt{6}}{3} = 3\sqrt{6}.$$

Do đó:

$$\sqrt{150} + \sqrt{1,6} \cdot \sqrt{60} + 4,5 \cdot \sqrt{2\frac{2}{3}} - \sqrt{6}$$

$$= 5\sqrt{6} + 4\sqrt{6} + 3\sqrt{6} - \sqrt{6}$$

$$= (5 + 4 + 3 - 1)\sqrt{6} = 11\sqrt{6}$$

c) Ta có:

$$\begin{aligned} &= (\sqrt{28} - 2\sqrt{3} + \sqrt{7})\sqrt{7} + \sqrt{84} \\ &= (\sqrt{4 \cdot 7} - 2\sqrt{3} + \sqrt{7})\sqrt{7} + \sqrt{4 \cdot 21} \\ &= (\sqrt{2^2 \cdot 7} - 2\sqrt{3} + \sqrt{7})\sqrt{7} + \sqrt{2^2 \cdot 21} \\ &= (2\sqrt{7} - 2\sqrt{3} + \sqrt{7})\sqrt{7} + 2\sqrt{21} \\ &= 2\sqrt{7} \cdot \sqrt{7} - 2\sqrt{3} \cdot \sqrt{7} + \sqrt{7} \cdot \sqrt{7} + 2\sqrt{21} \\ &= 2 \cdot (\sqrt{7})^2 - 2\sqrt{3 \cdot 7} + (\sqrt{7})^2 + 2\sqrt{21} \\ &= 2 \cdot 7 - 2\sqrt{21} + 7 + 2\sqrt{21} \\ &= 14 - 2\sqrt{21} + 7 + 2\sqrt{21} \\ &= 14 + 7 = 21. \end{aligned}$$

d) Ta có:

$$\begin{aligned} &(\sqrt{6} + \sqrt{5})^2 - \sqrt{120} \\ &= (\sqrt{6})^2 + 2 \cdot \sqrt{6} \cdot \sqrt{5} + (\sqrt{5})^2 - \sqrt{4 \cdot 30} \\ &= 6 + 2\sqrt{6 \cdot 5} + 5 - 2\sqrt{30} \\ &= 6 + 2\sqrt{30} + 5 - 2\sqrt{30} = 6 + 5 = 11. \end{aligned}$$