SM2 2.2: Operations with Radicals

Simplify each expression.

1) $-2\sqrt{5} \cdot \sqrt{10}$

2) $\sqrt{6} \cdot \sqrt{2}$

3) $\sqrt{6r^3} \cdot \sqrt{12r^3}$

4) $-\sqrt{8n^2} \cdot \sqrt{8n^2}$

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

6) $\sqrt{10}(4 + \sqrt{5})$

7) $-4\sqrt{6} + 2\sqrt{6}$

8) $-\sqrt{3} + 3\sqrt{6} + 2\sqrt{3}$

9) $-2\sqrt{5} - 2\sqrt{45}$

10) $-\sqrt{20} + 2\sqrt{45}$

Rationalize the denominator.

11) $\dfrac{\sqrt{3}}{\sqrt{12}}$

12) $\dfrac{3}{\sqrt{5}}$

13) $\dfrac{\sqrt{4}}{3\sqrt{16}}$

14) $\dfrac{3\sqrt{3}}{\sqrt{2}}$

15) $\dfrac{2\sqrt{5}}{\sqrt{3}}$

16) $\dfrac{\sqrt{4}}{\sqrt{5}}$

17) $\dfrac{2\sqrt{6}}{3\sqrt{25}}$

18) $\dfrac{2}{\sqrt{2}}$

19) $\dfrac{5\sqrt{2}}{\sqrt{5}}$

20) $-\dfrac{1}{2\sqrt{3}}$

21) $\dfrac{\sqrt{2}+5}{\sqrt{2}}$

22) $\dfrac{-3+2\sqrt{5}}{5\sqrt{2}}$

Determine which are rational ($\mathbb{Q}$) and which are irrational (I). Justify your response.

23) $-\sqrt{3} + 3\sqrt{25}$

24) $4 + \sqrt{6}$

25) $-2\sqrt{27} + 2\sqrt{27}$

26) $4\sqrt{10} \cdot \sqrt{20}$

27) $-\sqrt{8} \cdot \sqrt{2}$

28) $\sqrt{3} \cdot \sqrt{5}$