ADDING AND SUBTRACTING SURDS

Simplify the expressions in this exercise.

1 $\sqrt{3}+2\sqrt{3}+4\sqrt{3}$

$= 7\sqrt{3}$

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

$= 7\sqrt{7}$

3 $3\sqrt{5}+5\sqrt{5}-2\sqrt{5}$

$= 6\sqrt{5}$

8 $\sqrt{20}+\sqrt{5}$

9 $\sqrt{18}+\sqrt{32}-\sqrt{2}$

10 $\sqrt{27}+2\sqrt{48}-4\sqrt{3}$

(8) $\sqrt{20}+\sqrt{5} = \sqrt{2^2\times 5}+\sqrt{5} = 2\sqrt{5}+\sqrt{5} = 3\sqrt{5}$

(9) $\sqrt{18}+\sqrt{32}-\sqrt{2} = \sqrt{3^2\times 2}+\sqrt{2^4\times 2}-\sqrt{2} = 3\sqrt{2}+4\sqrt{2}-\sqrt{2} = 6\sqrt{2}$

(10) $\sqrt{27}+2\sqrt{48}-4\sqrt{3} = \sqrt{3^3}+2\sqrt{2^4\times 3}-4\sqrt{3}$

$= 3\sqrt{3}+8\sqrt{3}-4\sqrt{3}$

$= 7\sqrt{3}$

11 $\sqrt{12}+\sqrt{3}+\sqrt{48}$

12 $2\sqrt{50}-3\sqrt{18}$

13 $\sqrt{7}+\sqrt{28}-\sqrt{63}$

(11) $\sqrt{12}+\sqrt{3}+\sqrt{48} = \sqrt{2^2\times 3}+\sqrt{3}+\sqrt{2^4\times 3}$

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

(12) $2\sqrt{50}-3\sqrt{18} = 2\sqrt{2\times 5^2}-3\sqrt{3^2\times 2}$

$= 10\sqrt{2}-9\sqrt{2} = \sqrt{2}$

(13) $\sqrt{7}+\sqrt{28}-\sqrt{63} = \sqrt{7}+\sqrt{2^2\times 7}-\sqrt{3^2\times 7}$

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

$= 0$

ADDING AND SUBTRACTING SURDS

24 $5\sqrt{7}+3\sqrt{5}-2\sqrt{28}$ **25** $5\sqrt{45}-2\sqrt{32}$ **26** $\sqrt{98}-2\sqrt{20}-\sqrt{12}$

(24) $5\sqrt{7}+3\sqrt{5}-2\sqrt{28} = 5\sqrt{7}+3\sqrt{5}-2\sqrt{2^2\times 7}$

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

(25) $5\sqrt{45}-2\sqrt{32} = 5\sqrt{3^2\times 5}-2\sqrt{2^4\times 2}$

$= 15\sqrt{5}-8\sqrt{2}$

(26) $\sqrt{98}-2\sqrt{20}-\sqrt{12} = \sqrt{2\times 7^2}-2\sqrt{2^2\times 5}-\sqrt{2^2\times 3}$

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

27 $\sqrt{125}-5\sqrt{2}+\sqrt{50}$ **28** $7\sqrt{3}-2\sqrt{2}+\sqrt{12}+\sqrt{8}$ **29** $\sqrt{150}-\sqrt{96}-\sqrt{24}$

(27) $\sqrt{125}-5\sqrt{2}+\sqrt{50} = \sqrt{5^3}-5\sqrt{2}+\sqrt{2\times 5^2}$

$= 5\sqrt{5}-5\sqrt{2}+5\sqrt{2} = 5\sqrt{5}$

(28) $7\sqrt{3}-2\sqrt{2}+\sqrt{12}+\sqrt{8} = 7\sqrt{3}-2\sqrt{2}+\sqrt{2^2\times 3}+\sqrt{2^3}$

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

$= 9\sqrt{3}$

(29) $\sqrt{150}-\sqrt{96}-\sqrt{24} = \sqrt{2\times 3\times 5^2}-\sqrt{2^5\times 3}-\sqrt{2^2\times 6}$

$= 5\sqrt{6}-4\sqrt{6}-2\sqrt{6}$

$= -\sqrt{6}$