

Name:

Date:

Topic:

SURDS

Simplify each of the following surds.

1. $\sqrt{50}$

2. $\sqrt{28}$

3. $\sqrt{63}$

4. $\sqrt{180}$

5. $\sqrt{363}$

6. $\sqrt{117}$

7. $\sqrt{5} + 2\sqrt{5}$

8. $3\sqrt{2} - 5\sqrt{3} + 2\sqrt{3}$

9. $7\sqrt{2} - \sqrt{8}$

10. $5\sqrt{12} + 6\sqrt{3} - 2\sqrt{2}$

11. $5\sqrt{2} \times \sqrt{3}$

12. $6\sqrt{7} \times 4\sqrt{3}$

13. $5\sqrt{6} \times 8\sqrt{2} \times \sqrt{5}$

14. $15\sqrt{6} \div 3\sqrt{2}$

15. $2\sqrt{3} \div \sqrt{12}$

16. $(\sqrt{3}+4)(\sqrt{2}-1)$

For each of the following, express with a rational denominator in simplest form.

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

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

19. $\frac{7}{\sqrt{6}+2}$

20. $\frac{9}{3\sqrt{2}-5}$

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Simplify each of the following surds.

1. $\sqrt{50}$

$=\sqrt{25 \times 2}$

$=5\sqrt{2}$

2. $\sqrt{28}$

$=\sqrt{4 \times 7}$

$=2\sqrt{7}$

3. $\sqrt{63}$

$=\sqrt{9 \times 7}$

$=3\sqrt{7}$

4. $\sqrt{180}$

$=\sqrt{36 \times 5}$

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

$=6\sqrt{5}$

5. $\sqrt{363}$

$=\sqrt{121 \times 3}$

$=11\sqrt{3}$

6. $\sqrt{117}$

$=\sqrt{9 \times 13}$

$=3\sqrt{13}$

7. $\sqrt{5+2\sqrt{5}}$

$=3\sqrt{5}$

8. $3\sqrt{2}-5\sqrt{3}+2\sqrt{3}$

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

9. $7\sqrt{2}-\sqrt{8}$

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

$=5\sqrt{2}$

10. $5\sqrt{12}+6\sqrt{3}-2\sqrt{2}$

$=10\sqrt{3}+6\sqrt{3}-2\sqrt{2}$

$=16\sqrt{3}-2\sqrt{2}$

11. $5\sqrt{2} \times \sqrt{3}$

$=5\sqrt{6}$

12. $6\sqrt{7} \times 4\sqrt{3}$

$=24\sqrt{21}$

13. $5\sqrt{6} \times 8\sqrt{2} \times \sqrt{5}$

$=40\sqrt{60}$

$=40 \times 2\sqrt{15}$

$=80\sqrt{15}$

14. $15\sqrt{6} \div 3\sqrt{2}$

$=5\sqrt{3}$

15. $2\sqrt{3} \div \sqrt{12}$

$=\frac{2\sqrt{3}}{\sqrt{4 \times 3}}$

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

$=1$

16. $(\sqrt{3}+4)(\sqrt{2}-1)$

$=\sqrt{6}+4\sqrt{2}-\sqrt{3}-4$

For each of the following, express with a rational denominator in simplest form.

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

$=\frac{5}{\sqrt{6}} \times \frac{\sqrt{6}}{\sqrt{6}}$

$=\frac{5\sqrt{6}}{6}$

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

$=\frac{\sqrt{3}}{2\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}}$

$=\frac{\sqrt{15}}{10}$

19. $\frac{7}{\sqrt{6}+2}$

$=\frac{7}{\sqrt{6}+2} \times \frac{\sqrt{6}-2}{\sqrt{6}-2}$

$=\frac{7\sqrt{6}-14}{6-4}$

$=\frac{7\sqrt{6}-14}{2}$

20. $\frac{9}{3\sqrt{2}-5}$

$=\frac{9}{3\sqrt{2}-5} \times \frac{3\sqrt{2}+5}{3\sqrt{2}+5}$

$=\frac{27\sqrt{2}+45}{18-25}$

$=-\frac{27\sqrt{2}+45}{7}$