Adding Radicals
Reduce first so they have the same radicand
Add coefficients, keep radicand

Express each of the following in simplest radical form

1. $\sqrt{50} + \sqrt{50}$

$\sqrt{25}\sqrt{2}$ $\sqrt{25}\sqrt{2}$
$5\sqrt{2} + 5\sqrt{2}$
$10\sqrt{2}$

2. $\sqrt{32} + \sqrt{32}$

$\sqrt{16}\sqrt{2}$ $\sqrt{16}\sqrt{2}$
$4\sqrt{2} + 4\sqrt{2}$
$8\sqrt{2}$

3. $\sqrt{63} + \sqrt{28}$

$\sqrt{9}\sqrt{7}$ $\sqrt{4}\sqrt{7}$
$3\sqrt{7} + 2\sqrt{7}$
$5\sqrt{7}$

4. $\sqrt{45} + \sqrt{125}$

$\sqrt{9}\sqrt{5}$ $\sqrt{25}\sqrt{5}$
$3\sqrt{5} + 5\sqrt{5}$
$8\sqrt{5}$

5. $3\sqrt{18} + 2\sqrt{72}$

$3\sqrt{9}\sqrt{2}$ $2\sqrt{36}\sqrt{2}$
$3(3)\sqrt{2} + 2(6)\sqrt{2}$
$9\sqrt{2} + 12\sqrt{2}$
$21\sqrt{2}$

6. $5\sqrt{27} + 2\sqrt{75}$

$5\sqrt{9}\sqrt{3}$ $2\sqrt{25}\sqrt{3}$
$5(3)\sqrt{3} + 2(5)\sqrt{3}$
$15\sqrt{3} + 10\sqrt{3}$
$25\sqrt{3}$

Perfect Squares

1
4
9
16
25
36
49
64
81
100

7. $2\sqrt{200} + 2\sqrt{18}$

$2\sqrt{100}\ \sqrt{2}\ 2\sqrt{9}\ \sqrt{2}$

$2(10)\sqrt{2} + 2(3)\sqrt{2}$

$20\sqrt{2} + 6\sqrt{2}$

$26\sqrt{2}$

8. $4\sqrt{12} + 3\sqrt{48}$

$4\sqrt{4}\ \sqrt{3}\ 3\sqrt{16}\ \sqrt{3}$

$4(2)\sqrt{3} + 3(4)\sqrt{3}$

$8\sqrt{3} + 12\sqrt{3}$

$20\sqrt{3}$

9. $4\sqrt{80} + 2\sqrt{45} + 12$

$4\sqrt{16}\ \sqrt{5} + 2\sqrt{9}\ \sqrt{5} + 12$

$4(4)\sqrt{5} + 2(3)\sqrt{5} + 12$

$16\sqrt{5} + 6\sqrt{5} + 12$

$22\sqrt{5} + 12$

10. $4\sqrt{75} + 8 + 3\sqrt{24}$

$4\sqrt{25}\ \sqrt{3} + 8 + 2\sqrt{4}\ \sqrt{6}$

$4(5)\sqrt{3} + 8 + 2(2)\sqrt{6}$

$20\sqrt{3} + 8 + 4\sqrt{6}$

11. $3\sqrt{50} + 2\sqrt{75} + 4\sqrt{8}$

$3\sqrt{25}\ \sqrt{2}\ 2\sqrt{25}\ \sqrt{3}\ 4\sqrt{4}\ \sqrt{2}$

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

$10\sqrt{2} + 10\sqrt{3} + 8\sqrt{2}$

$18\sqrt{2} + 10\sqrt{3}$

12. $2\sqrt{294} + 3\sqrt{216} + 2\sqrt{180} + 6$

$2\sqrt{49}\ \sqrt{6} + 3\sqrt{36}\ \sqrt{6} + 2\sqrt{36}\ \sqrt{5} + 6$

$2(7)\sqrt{6} + 3(6)\sqrt{6} + 2(6)\sqrt{5} + 6$

$14\sqrt{6} + 18\sqrt{6} + 12\sqrt{5} + 6$

$32\sqrt{6} + 12\sqrt{5} + 6$