Homework: Simplifying Radicals

To simplify a radical, factor the expression under the radical sign to its prime factors. For every pair of like factors, bring out one of the factors. Multiply whatever is outside the sign, then multiply whatever is inside the sign. Remember that for each pair, you "bring out" only one of the numbers.

$\sqrt{4} = 2$ because 2 is a factor used twice (2 x 2 = 4).
2 2

$\sqrt{9} = 3$ because 3 is a factor used twice (3 x 3 = 9)
3 3

Examples :

$\sqrt{28}$
7 4
7 2 2
$2\sqrt{7}$

$\sqrt{54}$
9 6
3 3 3 2
$3\sqrt{2 \times 3} = 3\sqrt{6}$

$\sqrt{150}$
15 10
3 5 2 5
$5\sqrt{3x2} = 5\sqrt{6}$

$\sqrt{720}$
72 10
9 8 2 5
3 3 2 2 2 2 5
$3 \times 2 \times 2\sqrt{5} = 12\sqrt{5}$

Simplify completely:

1. $\sqrt{9} =$
2. $\sqrt{32}$
3. $\sqrt{50}$
4. $\sqrt{80}$
5. $\sqrt{72}$

6. $\sqrt{120}$
7. $\sqrt{68}$
8. $\sqrt{200}$
9. $\sqrt{180}$
10. $\sqrt{33}$

11. $3\sqrt{12}$
12. $5\sqrt{48}$
13. $2\sqrt{76}$
14. $-3\sqrt{32}$
15. $5\sqrt{80}$