

Simplifying Radicals

- Find the prime factorization of the radicand
- Look for the "twins" or factors that are the same
- Remove one "twin" or factor for each pair
- Leave any "singles" or single factors under the radical

Examples:

A)  $\sqrt{20} = \sqrt{2 \cdot 2 \cdot 5} = \sqrt{2 \cdot 2} \cdot 5 = 2\sqrt{5}$

B)  $3\sqrt{125b} = 3\sqrt{5 \cdot 5 \cdot 5 \cdot b} = 3\sqrt{5 \cdot 5} \cdot 5 \cdot b = 3 \cdot 5\sqrt{5b} = 15\sqrt{5b}$

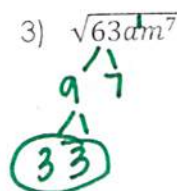
C)  $\sqrt{50r^5} = \sqrt{2 \cdot 5 \cdot 5 \cdot r \cdot r \cdot r \cdot r \cdot r} = \sqrt{2 \cdot 5 \cdot (5 \cdot r) \cdot (r \cdot r) \cdot (r \cdot r)} = 5r^2\sqrt{2r}$

Directions: Simplify the following:

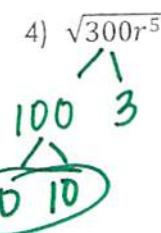
1)  $\sqrt{x^5} = x^2\sqrt{x}$



$2b\sqrt{2}$



$3m^3\sqrt{7am}$



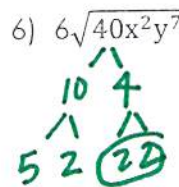
$10r^2\sqrt{3r}$

5)  $4\sqrt{29h^{10}}$

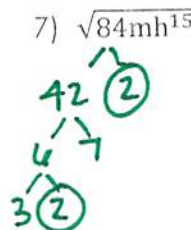
$4h^5\sqrt{29}$

**Shortcut:** Divide the exponent by 2. However many times it goes in evenly is on the outside & the remainder is on the inside.

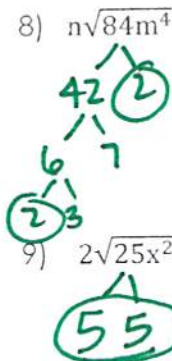
Even Exponent: NO Leftovers  
ODD Exponent: ONE Leftover



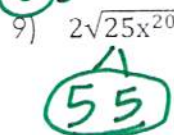
$12xy^3\sqrt{10y}$



$2h^7\sqrt{21mh}$



$2m^2n\sqrt{21}$



$10x^{10}$

10)  $-7\sqrt{54x^{11}}$

$-21x^5\sqrt{6x}$