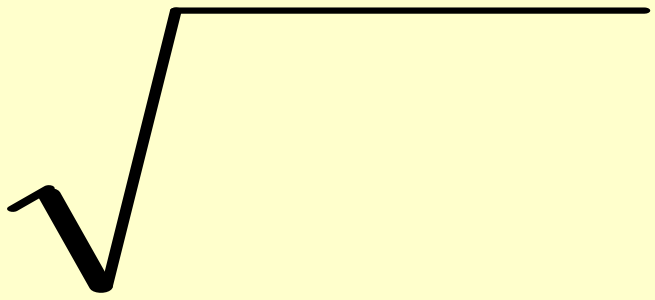
GSE Algebra I

Today's Question:
How do we simplify square roots?

Square Roots and Simplifying Radicals

Radical Sign (square root sign)



Radicand

Numbers or variables under the radical sign

Prime Numbers

2 3 5 7 11 13...

Radicals are in SIMPLEST FORM when..

1. No perfect square factors other than 1 are under the radical.

No fractions are under the radical.

No radicals are in the denominator.

Factor Trees to Prime Factorization

45

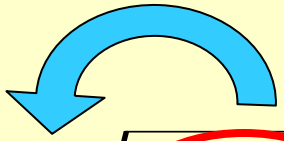
Factor Trees to Prime Factorization

54

Factor Trees to Prime Factorization

98

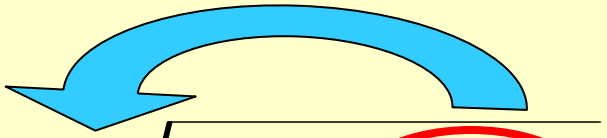
EX:1 Simplify.



$$\sqrt{45} = \sqrt{3 \bullet 3 \bullet 5} = 3\sqrt{5}$$

When you have a pair, bring the number out.

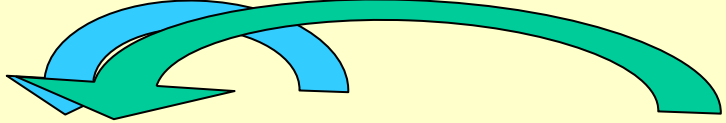
EX:2 Simplify



$$-\sqrt{98} = -\sqrt{2 \bullet 7 \bullet 7} = -7\sqrt{2}$$

When you have a pair, bring the number out.

EX:3



$$\sqrt{48} = \sqrt{2 \bullet 2 \bullet 2 \bullet 2 \bullet 3}$$

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

$$= 4\sqrt{3}$$

EX:4 Simplify.

$$2\sqrt{45} = 2\sqrt{3 \bullet 3 \bullet 5}$$

$$= 2 \bullet 3\sqrt{5}$$

$$= 6\sqrt{5}$$

You try!

1. $\sqrt{20}$ 2. $4\sqrt{40}$ 3. $-\sqrt{99}$ 4. $\sqrt{108}$

$2\sqrt{5}$ $8\sqrt{10}$ $-3\sqrt{11}$ $6\sqrt{3}$