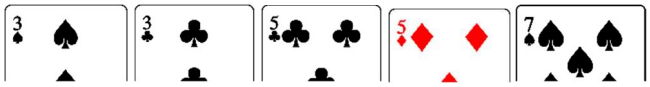
Go Fish Station

Ever played Go Fish? The idea is to get pairs of the same card. So if you have the cards…



…then you can make a pair of 3s and a pair of 5s, but the 7 is left in your hand.

Well, that's how simplifying square roots works, only instead of cards you use prime factors.

$$\sqrt{1575} = \sqrt{3 \cdot 3 \cdot 5 \cdot 5 \cdot 7}$$

Once you have the number factored into primes, you want to build pairs.

$$\sqrt{3 \cdot 3 \cdot 5 \cdot 5 \cdot 7}$$

The object of Go Fish is to get the cards out of your hand. The object when simplifying a radical is to get the numbers out of the radical (out of the *square root symbol*). You can do this when you get a pair; you trade both the numbers inside the radical to get the same number outside the radical.

$$\sqrt{3 \cdot 3 \cdot 5 \cdot 5 \cdot 7} = 3 \cdot \sqrt{5 \cdot 5 \cdot 7} = 3 \cdot 5 \cdot \sqrt{7}$$

Any numbers outside the radical get multiplied together. Any numbers left inside the radical also get multiplied back together. So the answer to this example problem is $15\sqrt{7}$.

This format is called simplest radical form. Simplest radical form lets us work with exact values rather than using decimal approximations.

Try some on your own.

1) $\sqrt{2 \cdot 2 \cdot 3 \cdot 3 \cdot 5} =$ $\sqrt{}$

2) $\sqrt{2 \cdot 3 \cdot 3 \cdot 5 \cdot 5 \cdot 11} =$ $\sqrt{}$

3) $\sqrt{3 \cdot 5 \cdot 5 \cdot x \cdot x} =$ $\sqrt{}$

4) $\sqrt{13 \cdot 13 \cdot x \cdot x \cdot x \cdot y \cdot y} =$ $\sqrt{}$

5) $\sqrt{20} = \sqrt{} =$ $\sqrt{}$

6) $\sqrt{3a^3} = \sqrt{} =$ $\sqrt{}$

7) $\sqrt{200} = \sqrt{} =$ $\sqrt{}$

8) $\sqrt{18a^3b^2} = \sqrt{} =$ $\sqrt{}$

9) $\sqrt{135} =$ ☐

12) $\sqrt{128} =$ ☐

11) $\sqrt{16a^7} =$ ☐