**1.2 – Square Roots of Non-Perfect Squares**

A **non-perfect square** is a number that is not a perfect square. The whole number 12 is a non-perfect square since there is no number multiplied by itself that gives 12. Pictorally, we cannot arrange 12 objects in a square array – only in rectangular arrays:



The closest we can get to a square is the 3 × 4 array, so this means that $\sqrt{12}$ is between 3 and 4.

To estimate a square root, use the closest perfect squares that surround the number as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Ex. 1: Estimate each square root to the nearest tenth.

1. $\sqrt{12}$ (b) $\sqrt{7.5}$

Ex. 2: Find a decimal number that has a square root between 8 and 9. Show your strategy.

To estimate the square root of a fraction, try to turn it into a decimal and then use benchmarks.

Ex. 3: Estimate each square root.

1. $\sqrt{\frac{8}{10}}$ (b) $\sqrt{\frac{3}{5}}$

(c) $\sqrt{\frac{3}{7}}$ (d) $\sqrt{\frac{19}{6}}$

Ex. 4: Determine the unknown length in each triangle, to one decimal place.



1. (b)

Assignment: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_