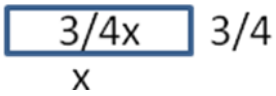
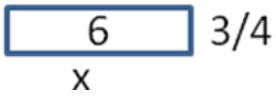
Al-Khwarizmi
Application

1. Al-Khwarizmi used geometric figures to illustrate his solution of an equation. Solve the following equations using geometric representation. Explain your thinking.
   a. Solve 3/4x=6

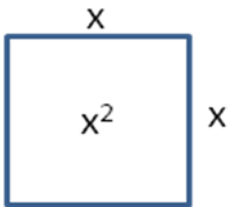



*Equation tells us that the area of the rectangle is equal to 6.*

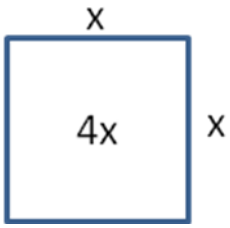



*Solve for x by dividing 6 by ¾.*
*6/(3/4)=8* ***X=8***

   b. Solve $x^2=4x$

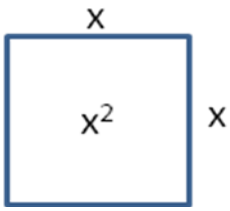



*Equation tells us that the area of the square is equal to 4x.*

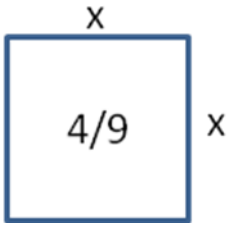



*One of the dimensions will cancel out the 'x' in the 4x leaving 4=x so answer is* ***X=4.***

   c. Solve $x^2=4/9$

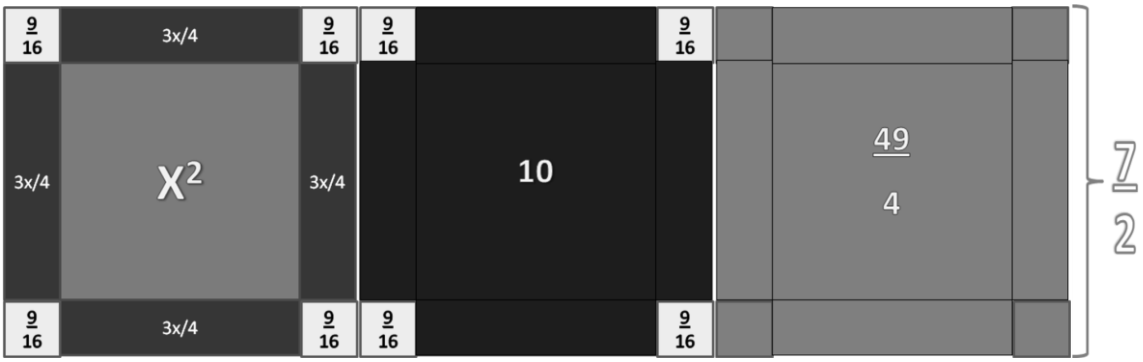



*Equation tells us that the area of the square is equal to 4/9.*

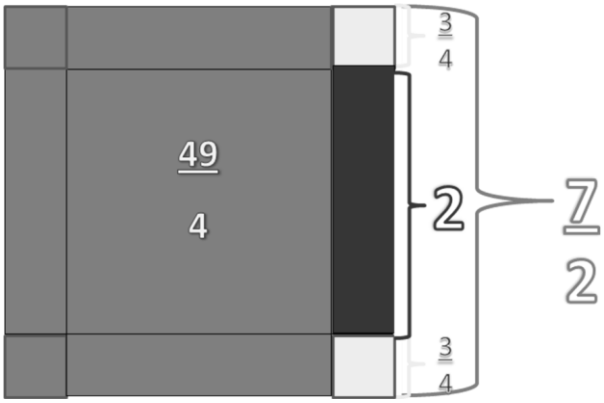



*Take the square root of 4/9 to solve for x. X=2/3.*

d. Solve $x^2 + 3x = 10$



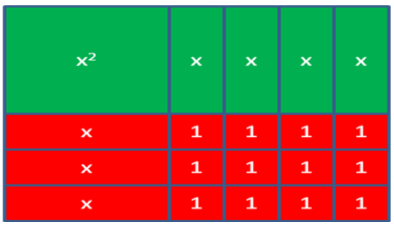

*The square root of 49/4 is 7/2 which is the length of the large square.*




*Subtract 2(3/4) from 7/2 to get answer of 2.* ***X=2.***

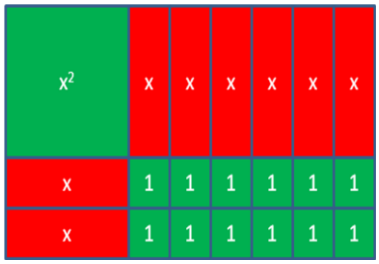
2. Solve the following equations using manipulatives.

a. $x^2+x-12=0$



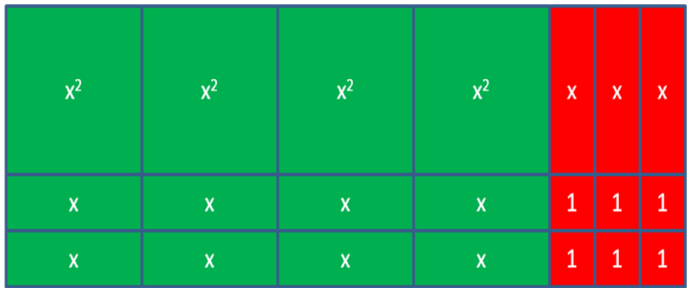

*The dimension are x+4 and x-3. Thus the roots are x=-4 and x=3*

b. $x^2-8x+12=0$




*The dimensions are x-6 and x-2. The roots are x=6 and x=2*

c. $4x^2+5x-6=0$

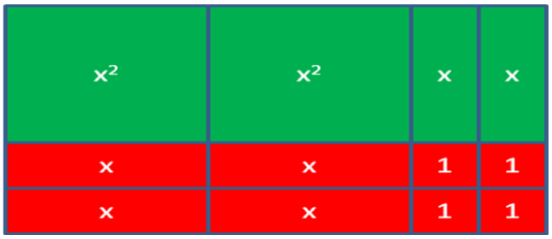



*The dimensions are 4x-3 and x+2. The roots are x=3/4 and x=-2*

d. $-2x^2+2x+4=0$

*First rearrange the formula so that $x^2$ is positive.*

*$2x^2-2x-4=0$*




*The dimensions are 2x+2 and x-2 The roots are x=-1 and x=2*