

## Homework 4 - Math 140

*Solve the following equations.*

1.  $3x^{-4} = 48.$

2.  $(x^{-1} + 5)^{-2} = \frac{1}{4}.$

3.  $\sqrt{x + 25} = x + 5.$

4.  $x^{-3/4} = \frac{1}{125}.$

5.  $x^2 - 4x = 0$

6.  $x^2 + 12x + 20 = 0$

7.  $x(x - 3)(5x - 4) = 0$

8.  $\frac{(x + 1)(x - 5)}{(x - 2)^2} = 0$

9.  $\left(\frac{1}{2}\right)^x = 64$

10.  $\frac{x^2 - 4x + 3}{x - 2} = 0$

Suppose that  $p(x) = x^2 - 8x + 12$ .

11. What are the roots of  $p(x)$ ?
12. Draw and label a sketch of the graph of  $p(x)$  including the  $y$ -value of the vertex.

13. Local manufacturers of wooden chairs will produce  $\frac{1}{10}p^2$  chairs per month if the price of a chair is  $p$  dollars. Buyers will purchase  $60 - p$  chairs per month. At what price level will the supply of wooden chairs equal the demand?

14. Producers will supply  $x$  units of a certain commodity when the price is  $p = x + 2$  and consumers will demand (purchase)  $x$  units when the price is  $p = \frac{80}{x}$ . Find the equilibrium level of production.