

Use any method to solve for x.

4) $5x^2 + 100 = 0$

$$\begin{aligned} 5x^2 &= -100 \\ +5 & \\ x^2 &= -20 \\ \sqrt{} \quad \sqrt{} & \\ x &= \pm \sqrt{-20} \end{aligned}$$

$x = \pm 2i\sqrt{5}$

5) $3x = x^2$

$$\begin{aligned} -3x & \quad -3x \\ x^2 - 3x &= 0 \\ x(x-3) &= 0 \\ x=0 & \quad x-3=0 \\ & \quad \quad x=3 \end{aligned}$$

6) $15x^2 - x - 2 = 0$

$$\begin{aligned} & \begin{array}{c} -30 \\ -6 \quad 5 \\ -1 \end{array} \\ & \underline{15x^2 - 6x + 5x - 2 = 0} \\ & 3x(5x-2) + 1(5x-2) = 0 \\ & (3x+1)(5x-2) = 0 \end{aligned}$$

$$\begin{aligned} 3x+1 &= 0 & 5x-2 &= 0 \\ 3x &= -1 & 5x &= 2 \\ x &= -1/3 & x &= 2/5 \end{aligned}$$

Write in vertex form using completing the square.

7) $y = 5x^2 - 10x + 12$

$$\begin{aligned} y &= 12 = 5(x^2 - 2x) \\ (-2/2)^2 & \quad (-1)^2 = 1 \\ y - 12 + 5 &= 5(x^2 - 2x + 1) \\ y - 7 &= 5(x-1)^2 \\ y &= 5(x-1)^2 + 7 \end{aligned}$$

Use your answer to #7 to answer the following questions.

8) Find the vertex.

$(1, 7)$

9) Describe the transformation

Vertical stretch of 5
Translation 1R, 7U

10) Find the solution for the given system.

$y = x^2 + x$

$y = -2x + 40$

$0 = x^2 + 3x - 40$

$$\begin{aligned} & \begin{array}{c} -40 \\ 8 \quad -5 \\ 3 \end{array} \\ & (x-5)(x+8) = 0 \\ & x-5=0 \quad x+8=0 \\ & x=5 \quad x=-8 \end{aligned}$$

$$\begin{aligned} y &= 5^2 + 5 = 25 + 5 = 30 \\ y &= (-8)^2 + (-8) = 64 - 8 = 56 \\ & (5, 30) \quad (-8, 56) \end{aligned}$$