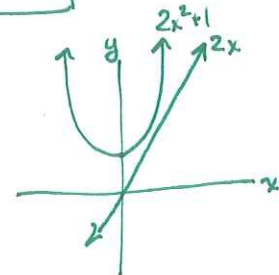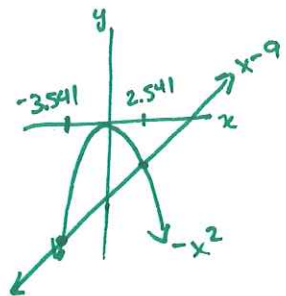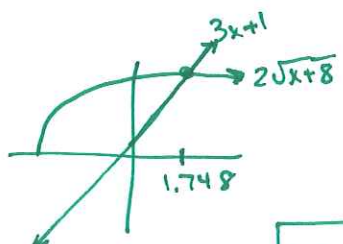## 1.1 Modeling and Equation Solving

Work with your group to solve the following equations.

Solve the equation algebraically.

$$5x^2 - x - 30 = 2x^2 - x$$
$$\underline{-2x^2 + x} \qquad \underline{-2x^2 + x}$$
$$3x^2 - 30 = 0$$
$$3(x^2 - 10) = 0$$
$$x^2 - 10 = 0$$
$$x^2 = 10$$
$$\boxed{x = \pm\sqrt{10}}$$

Solve the equation graphically.

$$2x^2 + 1 = 2x$$

$$\boxed{\text{no Solution}}$$

Solve the equation graphically.

$$-x^2 = x - 9$$

$$\boxed{\begin{array}{l} x = 2.541 \\ x = -3.541 \end{array}}$$

Solve the equation algebraically.

$$x(7x + 3) = 4$$
$$7x^2 + 3x = 4$$
$$7x^2 + 3x - 4 = 0$$
$$(7x - 4)(x + 1) = 0$$
$$7x - 4 = 0 \qquad x + 1 = 0$$
$$7x = 4 \qquad \boxed{x = -1}$$
$$\boxed{x = \tfrac{4}{7}}$$

Solve the equation graphically.

$$3x + 1 = 2\sqrt{x + 8}$$

$$\boxed{x = 1.748}$$

Solve the equation algebraically.

$$(x - 1)^2 = -4x$$

$$(x-1)(x-1)$$

$$x^2 - 2x + 1 = -4x$$
$$ +4x \qquad +4x$$
$$x^2 + 2x + 1 = 0$$
$$(x + 1)(x + 1) = 0$$
$$x + 1 = 0$$
$$\boxed{x = -1}$$