Problem 4

50 family × $9.50 charge = $475 make

$P(x) = [50 - 2(x)][9.50 + 0.50(x)]$

$P(x) = 475 + 25x - 19x - 1x^2$

$P(x) = -x^2 + 6x + 475$

a) $P(x) = -x^2 + 6x + 475$

b) Max

$x = \frac{-b}{2a} = \frac{-6}{2(-1)} = \frac{6}{2} = 3$

3 increases

$\$9.50 + 0.50(3) = \boxed{\$11}$

c) P(3)

$P(3) = -(3)^2 + 6(3) + 475$

$= -9 + 18 + 475$

$\boxed{P(3) = \$484}$

Problem 5

300 people × $8 cost = $2400 make

$P(x) = [300 - 20(x)][\$8 + \$1(x)]$

$P(x) = 2400 + 300x - 160x - 20x^2$

$P(x) = -20x^2 + 140x + 2400$

a) max

$x = \frac{-b}{2a} = \frac{-140}{-2(20)} = 3.5$ increases

$\$8 + 1(3.5) = \boxed{\$11.50}$

b) $P(3.5) = -20(3.5)^2 + 140(3.5) + 2400$

$P(3.5) = -245 + 490 + 2400$

$= \boxed{2645}$

Problem 6

y-intercept at $y = -5$

Roots at $x = 5, -1$

$(x - 5)(x - (-1)) = 0$

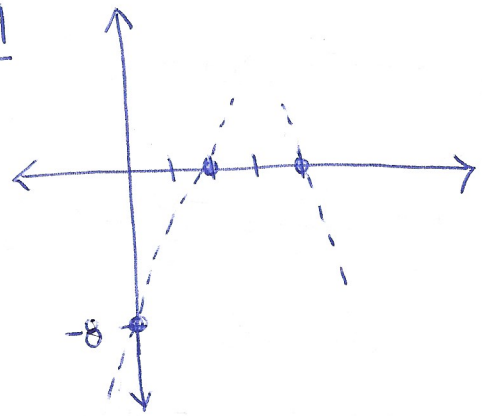
$(x - 5)(x + 1) = 0$

$x^2 + x - 5x - 5 = 0$

$\boxed{x^2 - 4x - 5 = 0}$

Higher order Thinking

Prob 1



Madison is correct.

Prob 2

Yes, by definition of the axis of symmetry.