

Key

Chapter 2 Review Day 2

Make the scale drawing of a cross section of a 24 foot wide parabolic satellite dish where each square is 1ft x 1ft. The dish is designed using the equation $y = .05x^2 + 3$.

x	y
0	3
1	3.05
-1	3.05
2	3.2
-2	3.2
3	3.45
-3	3.45
4	3.8
-4	3.8
5	4.25
-5	4.25
6	4.8
-6	4.8
7	5.45
-7	5.45

a) List at least 13 ordered pairs.

$$y = ax^2 + bx + c$$

$$x = \frac{-b}{2a} = \frac{-0}{2(0.05)} = \frac{0}{0.1} = 0$$

$$y = 0.05(0)^2 + 3$$

$$y = 0 + 3$$

$$y = 3$$

$$y = 0.05(1)^2 + 3$$

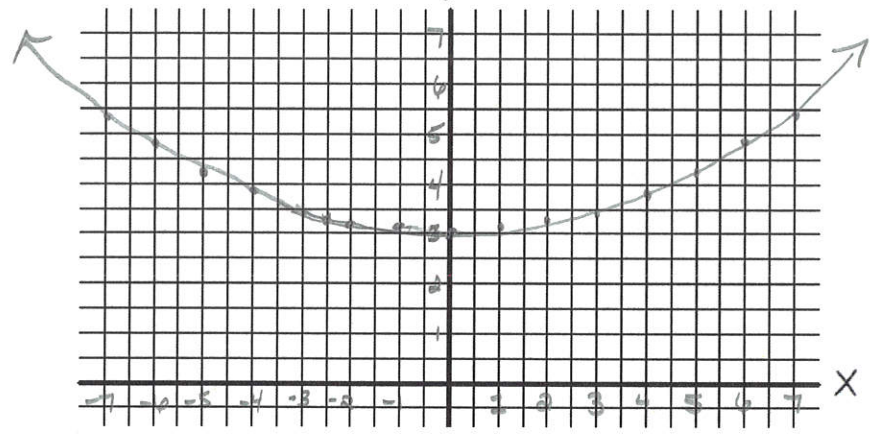
$$y = 3.05$$

$$y = 0.05(2)^2 + 3$$

$$y = 3.2$$

Keep going with calc.

Focus



b) Include the focus point on your graph

focus is $\frac{1}{4a}$ above the bottom of the dish

Bottom of the dish = 3

$$3 + \frac{1}{4a}$$

$$3 + \frac{1}{4(0.05)}$$

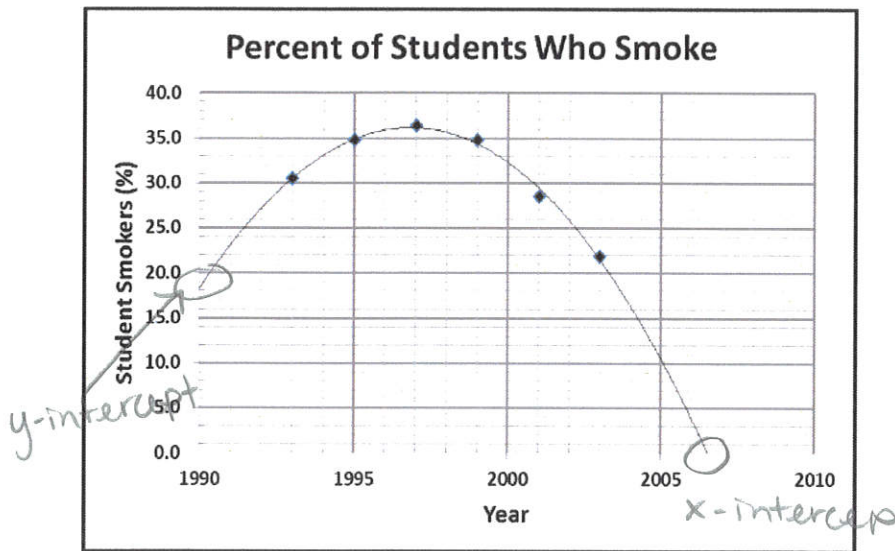
$$3 + \frac{1}{0.2}$$

$$3 + 5 = 8$$

(0, 8)

The percent of high school students who smoke is shown in the table.

x	y
Year	Percent
1993	30.5
1995	34.8
1997	36.4
1999	34.8
2001	28.5
2003	21.9



$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

Find the slope between 1993 and 1997, accurate to 1 decimal place. Explain the meaning of the slope in context.

$$m = \frac{36.4 - 30.5}{1997 - 1993} = \frac{5.9}{4} = 1.475 \approx 1.5$$

Between 1993 and 1997 the percent of students who smoke went up by 1.5 percent.

Give the coordinate for the x-intercept from the graph and explain its meaning in context in a complete sentence.

$(2006.5, 0)$ between 2006 & 2007

In about 2006.5 the percent of student who smoke will be zero

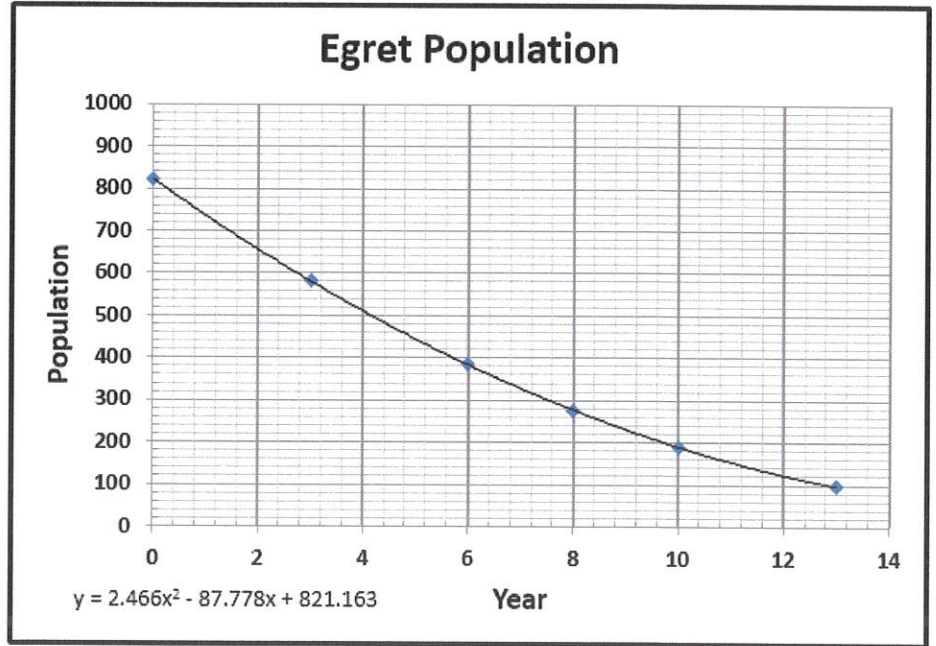
Give the coordinate for the y-intercept from the graph and explain its meaning in context in a complete sentence.

$(1990, 18)$

In 1990 about 18 percent of students smoked

Use regression to find a quadratic equation to model the data. Round the numbers in your equation to 2 decimal places.

Year (After 2000)	Population
0	820
3	582
6	384
8	276
10	188
13	98



$a = 2.465964548$
 $b = -87.77779531$
 $c = 821.1628702$

$y = ax^2 + bx + c$

$y = 2.47x^2 - 87.78x + 821.16$

Use your equation to predict the year when the population will again reach 600, accurate to 1 decimal place.

$y = 600$
 $600 = 2.47x^2 - 87.78x + 821.16$
 -600 -600

 $2.47x^2 - 87.78x + 221.16 = 0$

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$x = \frac{-(-87.78) \pm \sqrt{(-87.78)^2 - 4(2.47)(221.16)}}{2(2.47)}$

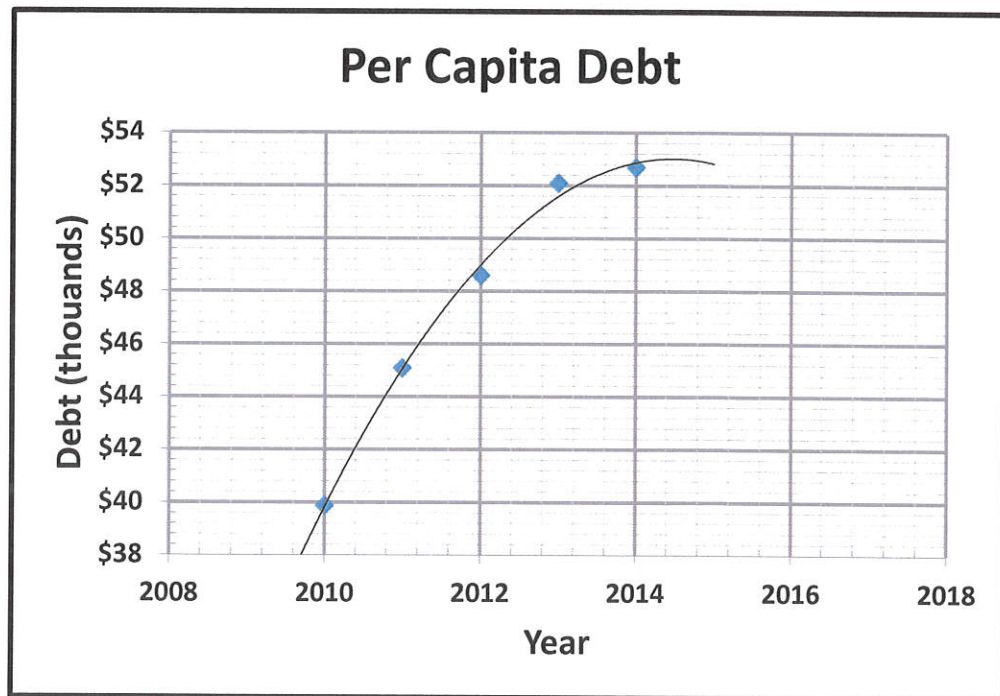
$x = \frac{87.78 \pm \sqrt{5520.2674}}{4.94}$

$x = 32.86941363$ or $x = 2.729047905$
 2032.8 2002.7
 In 2032 and 2002 the population will reach 600 egrets

The American debt per capita is shown in the chart. This is the total debt divided among every man, woman and child in America ... wow!

Use regression to find a quadratic equation to model the data. Round the numbers in your equation to 2 decimal places.

Year	Debt (thousands)
2010	\$39.88
2011	\$45.09
2012	\$48.60
2013	\$52.09
2014	\$52.69



$$a = -0.66$$
$$b = 2659.102$$
$$c = -2678289.194$$

$$y = -0.66x^2 + 2659.10x - 2678289.19$$

Use your equation to predict the debt in 2016.

$$x = 2016$$

$$y = -0.66(2016)^2 + 2659.10(2016) - 2678289.19$$

$$y = \$47.45 \approx \$47,450$$

In 2016 the debt was about \$47.45 thousand or \$47,450