

CHAPTER 4 STATIONS REVIEW

Name: KEY!

Date: _____ Period: _____

STATION #1: 4.1 AND 4.2 LINEAR AND QUADRATIC FUNCTIONS

1)

$$y = -2x^2 - 3x + 2$$

vertex: $x = \frac{3}{2(-2)} = -\frac{3}{4}$

$$f(-\frac{3}{4}) = \frac{25}{8}$$

input: $x = -\frac{3}{4}$
range: $y \leq \frac{25}{8}$

2) $f(3) = 12$ $f(2) = -2$ $(3, 12)$ $(2, -2)$

$$\frac{12 - (-2)}{3 - 2} = 14$$

$$y + 2 = 14(x - 2)$$

$y = 14x - 30$

3) $(27,000, 10)$ (number of tix sold, Price)

a) $m = \frac{\Delta P}{\Delta n} = \frac{-1}{3,000}$

$$P - 10 = \frac{-1}{3,000}(n - 27,000)$$

$P = \frac{-1}{3000}n + 19$

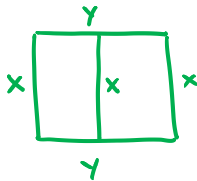
b) Revenue = Price \cdot Number tix sold = $P \cdot n$

$$R(n) = \left(\frac{-1}{3000}n + 19\right)n$$

$$R(n) = \frac{-1}{3000}n^2 + 19n$$

STATION #2: 4.4 MODELING FUNCTIONS AND 4.5 MAX/MINS

1)



$$3x + 2y = 1200$$

$$y = -\frac{3}{2}x + 600$$

$$A = xy$$

$$A(x) = x\left(-\frac{3}{2}x + 600\right)$$

$$A(x) = -\frac{3}{2}x^2 + 600x$$

$-\frac{b}{2a} = \frac{-600}{2(-\frac{3}{2})} = 200$

$x = 200$
 $y = 300$

$200\text{ft} \times 300\text{ft}$

2) $(x, 2\sqrt{x+2} + 1)$ $(6, 1)$

$$\sqrt{(x-6)^2 + (2\sqrt{x+2} + 1 - 1)^2} = \text{Distance}$$

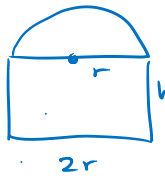
$$\sqrt{x^2 - 12x + 36 + 4(x+2)} = 0$$

$$\sqrt{x^2 - 8x + 44} = 0$$

$-\frac{b}{2a} = \frac{8}{2} = 4$ minimum distance:

$$\sqrt{4^2 - 32 + 44} = \sqrt{28} = 2\sqrt{7}$$

2)



$$P = 2r + 2h + \frac{2\pi r}{2}$$

$$20 = 2r + 2h + \pi r$$

$$2h = 20 - 2r - \pi r$$

$$A = \frac{\pi r^2}{2} + 2rh$$

$$A(r) = \frac{\pi r^2}{2} + r(20 - 2r - \pi r)$$

$$A(r) = \frac{\pi r^2}{2} + 20r - 2r^2 - \pi r^2$$

$$A(r) = \frac{-\pi - 4}{2}r^2 + 20r$$

$$r = \frac{-20}{2(-\frac{\pi-4}{2})} = \frac{-20}{-\pi-4} = \frac{20}{\pi+4}$$

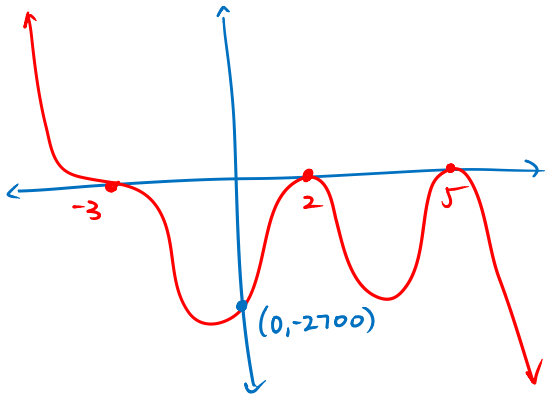
Radius $\frac{20}{\pi+4}$

STATION #3: 4.6 POLYNOMIAL FUNCTIONS

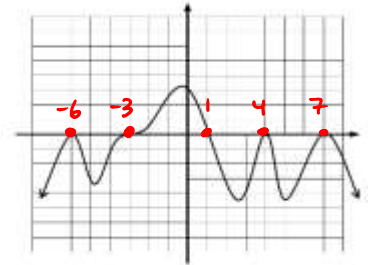
1)

$$y = (x-5)^2(x+3)^3(x-2)(2-x)$$

$$y = -(x-2)^2(x-5)^2(x+3)^3$$



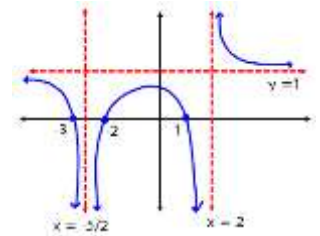
2)



$$y = -(x+6)^2(x+3)^3(x-1)(x-4)^2(x-7)^2$$

3)

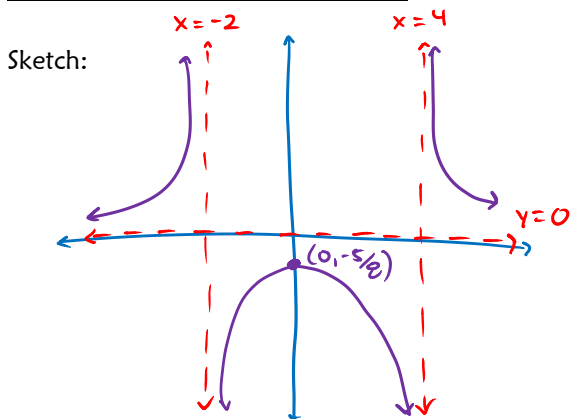
$$y = \frac{4(x-1)(x+2)(x+3)}{(2x+5)^2(x-2)}$$



STATION #4: RATIONAL FUNCTIONS

1. $y = \frac{5}{x^2 - 2x - 8} = \frac{5}{(x-4)(x+2)}$

Hole:	none
x-int:	none
y-int:	$(0, -5/8)$
V.A.	$x=4$ $x=-2$
H.A.	$y=0$
S.A.	none



*For additional practice/review – reference the graphing worksheet!

2)

$$x^2 - 2 = 0$$

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

$$\text{VA: } x = \pm\sqrt{2}$$

HA: none

Slant: $y = 3x - 4$

$$x^2 + 0x - 2 \begin{array}{l} \overline{3x - 4} \\ 3x^3 - 4x^2 + 0x + 1 \\ \underline{3x^3 + 0x - 6x} \\ -4x^2 - 6x \\ \underline{-4x^2 + 0x} \\ -6x \end{array}$$

3)

HA: $y = 1$

$$1 = \frac{x^2 + x - 12}{x^2 - 4}$$

$$x^2 - 4 = x^2 + x - 12$$

$$0 = x$$

$$\boxed{(8, 1)}$$