Today's Plan:

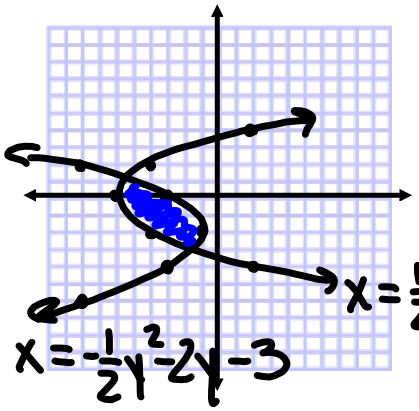
Learning Target (standard): I will find the area of a region. I will use the area of the region to describe other quantities.

Students will: Complete practice problems over previous concepts at the boards, put up homework problems on the board and make necessary corrections to their own work, take notes over new material and complete practice problems over new concepts.

Teacher will: Provide practice problems over previous concepts, check homework problems for accuracy and provide students feedback, describe and provide examples of new concepts and assign students assessment problems over new concepts.

Assessment: Board work, homework check and homework assignment

Differentiation: Students will work at the board, go over and correct homework at their seats, actively engage in lecture over new concepts, practice new concepts with the aid of other students and the teacher and complete homework assignment.



5) $x=\frac{1}{2}y^2-6$

$x=-\frac{1}{2}y^2-2y-3$

$y=-\frac{b}{2a}=\frac{2}{2(-\frac{1}{2})}=-2$

$x=-\frac{1}{2}(-2)^2-2(-2)-3$

$=-2+4-3$

$x=-1$ vertex: $(-1,-2)$

$x=-\frac{1}{2}(2)^2-2(2)-3$

$=-2-4-3$

$x=-8$

x	y
-8	-6
-3	-4
-1	-2
-3	0
-8	2

a) $y=-\frac{b}{2a}=0$

vertex: $(-6,0)$

x	y
2	-4
-4	-2
-6	0
-4	2
2	4

$-\frac{1}{2}y^2-2y-3=\frac{1}{2}y^2-6$

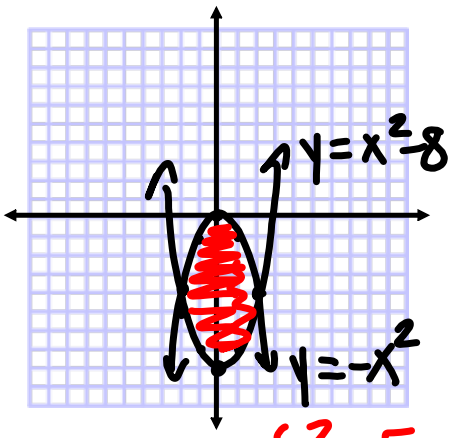
$0=y^2+2y-3$

$0=(y+3)(y-1)$

$y=-3, 1$

$A=\int_{-3}^{1}\left[\left(-\frac{1}{2}y^2-2y-3\right)-\left(\frac{1}{2}y^2-6\right)\right]dy$

Find the area of the region bounded by:



$-x^2 = x^2 - 8$

$0 = 2x^2 - 8$

$0 = 2(x^2 - 4)$

$0 = 2(x+2)(x-2)$

$x = -2, 2$

$$A = \int_{-2}^{2} [-x^2 - (x^2 - 8)]\,dx$$

$$= \int_{-2}^{2} (-2x^2 + 8)\,dx$$

$$= \left(-\frac{2}{3}x^3 + 8x\right)\Big|_{-2}^{2}$$

$$= \left(-\frac{16}{3} + 16\right) - \left(\frac{16}{3} - 16\right)$$

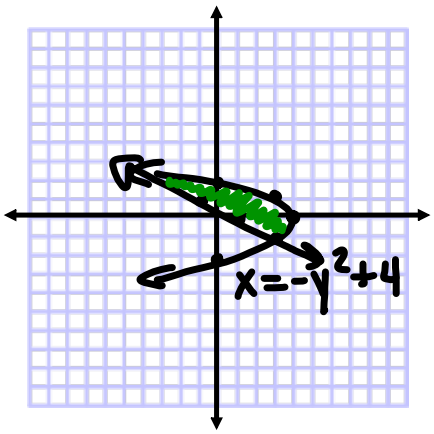
$$= -\frac{32}{3} + 32$$

$$A = \frac{64}{3}\,u^2$$

Find the area of the region bounded by:

$y^2 = 4 - x$

$x + 2y - 1 = 0$



$X = -2y + 1$

x	y
3	-1
1	0
-1	1

$x = -y^2 + 4$

$y = -\frac{b}{2a} = 0$

vertex: (4, 0)

x	y
3	-1
4	0
3	1

$-y^2 + 4 = -2y + 1$

$0 = y^2 - 2y - 3$

$0 = (y-3)(y+1)$

$y = -1, 3$

$$A = \int_{-1}^{3} \left[(-y^2+4) - (-2y+1)\right] dy$$

$$= \int_{-1}^{3} (-y^2 + 2y + 3)\, dy$$

$$= \left(-\frac{1}{3}y^3 + y^2 + 3y\right)\Big|_{-1}^{3}$$

$$= (-9 + 9 + 9) - \left(\frac{1}{3} + 1 - 3\right)$$

$$= 9 + 2 - \frac{1}{3}$$

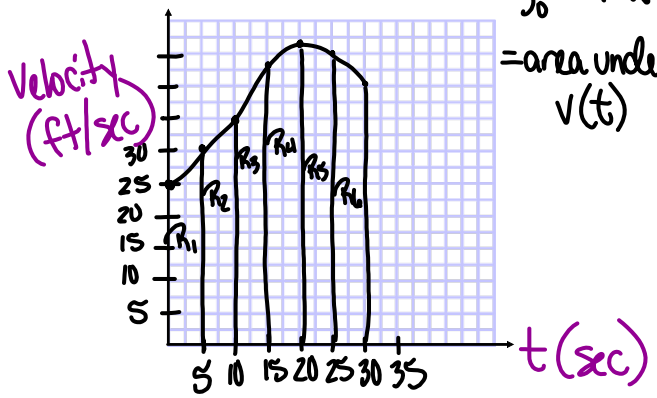
$$= 11 - \frac{1}{3}$$

$$A = \frac{32}{3}\, u^2$$

Suppose the odometer on your car is broken and you want to estimate the distance driven over a 30-second time interval. You took speedometer readings every five seconds and recorded them in the table. Use these recordings to estimate your distance.

Time(sec)	0	5	10	15	20	25	30
Velocity(*ft* / sec)	25	31	35	43	47	46	41

$d = \int_0^{30} v(t)\,dt$ = area under $v(t)$



$A_{trap} = \frac{1}{2}(b_1 + b_2)\cdot h$

units $= x \cdot y$
$=$ seconds $\cdot \frac{ft}{seconds}$
$=$ feet

$A_{R_1} = \frac{1}{2}(25+31)\cdot 5$
$= \frac{5}{2}(56)$
$A_{R_1} = 140$ ft

$A_{R_2} = \frac{1}{2}(31+35)\cdot 5$
$= \frac{5}{2}(66)$
$A_{R_2} = 165$ ft

$A_{R_3} = \frac{1}{2}(35+43)\cdot 5$
$= \frac{1}{2}(78)\cdot 5$
$A_{R_3} = 195$ ft

$A_{R_4} = \frac{1}{2}(43+47)\,5$
$= \frac{1}{2}(90)\cdot 5$
$A_{R_4} = 225$ ft

$A_{R_5} = \frac{1}{2}(47+46)\cdot 5$
$= \frac{1}{2}(93)\cdot 5$
$A_{R_5} = \frac{465}{2}$ ft

$A_{R_6} = \frac{1}{2}(46+41)\cdot 5$
$= \frac{5}{2}(87)$
$A_6 = \frac{435}{2}$ ft

$d \approx A_{R_1} + A_{R_2} + A_{R_3} + A_{R_4} + A_{R_5} + A_{R_6}$

$d \approx 140 + 165 + 195 + 225 + \frac{465}{2} + \frac{435}{2}$

$d \approx 1175$ ft

Assignment:

Area Applications Graph Packet