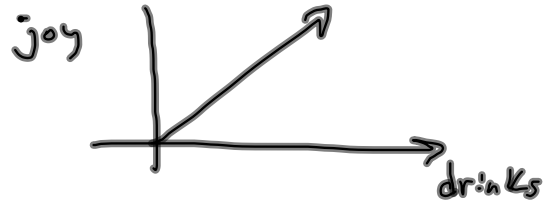


Questions?

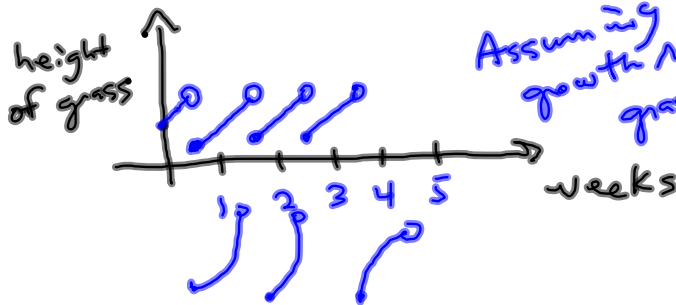
S1.1 Summary:

1. Symbolically / Algebraically
2. Graphically
3. Numerically
4. Verbally - The more he drinks, the happier he is.

READ YOUR BOOK!



S1.1 #17



Assuming growth rate of grass is constant
Height is linear (on each piece)

Equation of a circle centered
at (h, k) , with radius r .

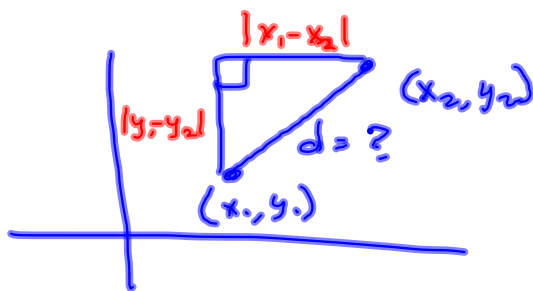
$$(x-h)^2 + (y-k)^2 = r^2$$

Circle is set of points equidistant from
a fixed point.

(h, k)

If (x, y) is on the circle, then

$$\sqrt{(x-h)^2 + (y-k)^2} = r$$



$$d = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$

What is the Function describing the top $\frac{1}{2}$ of the circle $(x-2)^2 + (y+3)^2 = 25$. Give y as a function of x .

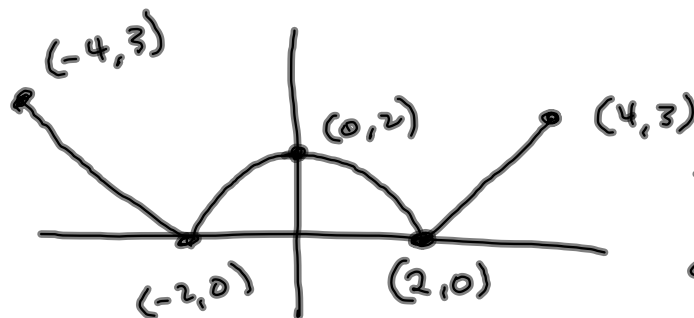
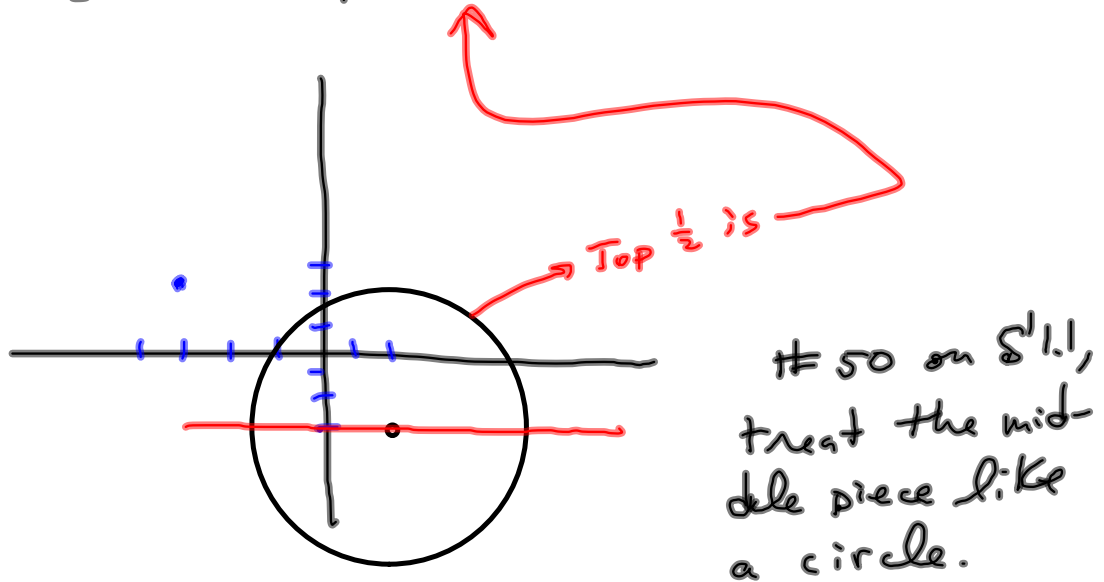
Solve for y :
 Isolate $(y+3)^2$
 $\dots$ $y+3$
 $\dots$ y

$$\begin{aligned}(y+3)^2 &= 25 - (x-2)^2 \\ \sqrt{(y+3)^2} &= \sqrt{25 - (x-2)^2} \\ |y+3| &= \sqrt{25 - (x-2)^2} \\ y+3 &= \pm \sqrt{25 - (x-2)^2} \\ y &= -3 \pm \sqrt{25 - (x-2)^2}\end{aligned}$$

$$\begin{aligned}\Rightarrow \sqrt{(y+3)^2} &= |y+3| \\ \sqrt{3^2} &= 3 \\ \sqrt{(-3)^2} &= 3 \\ \sqrt{x^2} &= \begin{cases} x & \text{if } x \geq 0 \\ -x & \text{if } x < 0 \end{cases} = |x|\end{aligned}$$

$$|x| = 5 \text{ means } x = 5 \text{ or } x = -5, \text{ i.e., } x = \pm 5$$

$$y = -3 + \sqrt{25 - (x-2)^2} \quad \text{is top half}$$



Describe algebraically.

$$f(x) = \begin{cases} \underline{\hspace{2cm}} & -4 \leq x < -2 \\ \underline{\hspace{2cm}} & -2 \leq x < 2 \\ \underline{\hspace{2cm}} & 2 \leq x \leq 4 \end{cases}$$

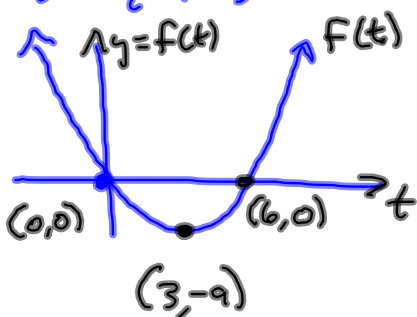
$$f(t) = t^2 - 6t$$

Graph. State $\mathcal{D} \subseteq \mathbb{R}$

$$\textcircled{1} \quad t^2 - 6t = 0$$

$$t(t-6) = 0$$

$$t \in \{0, 6\}$$



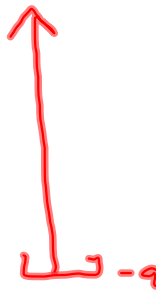
$$f(3) = 3^2 - 6(3) = 9 - 18 = -9$$

$$\mathcal{D} = \mathbb{R} = \underbrace{\{t \mid f(t) \text{ exists}\}}_{\text{In general}}$$

$$\mathcal{R} = [-9, \infty)$$

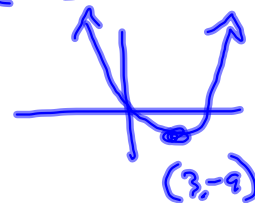
$$-\frac{b}{2a} \text{ ouch!}$$

$$\frac{6}{2(1)} = 3 = h$$



$$\textcircled{2}$$

$$\begin{aligned} f(t) &= t^2 - 6t \\ &= t^2 - 6t + 3^2 - 3^2 \\ &= (t-3)^2 - 3^2 \\ &= (t-3)^2 - 9 \\ (h, k) &= (3, -9) \end{aligned}$$



S1.1

S1.2 Due Friday Read it Start it.

Diagnostic Test - Peck away

$$x|x| = x \cdot \begin{cases} x & \text{if } x \geq 0 \\ -x & \text{if } x < 0 \end{cases} = \begin{cases} x^2 & \text{if } x \geq 0 \\ -x^2 & \text{if } x < 0 \end{cases}$$

