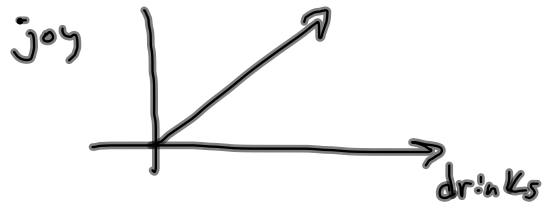
Questions?

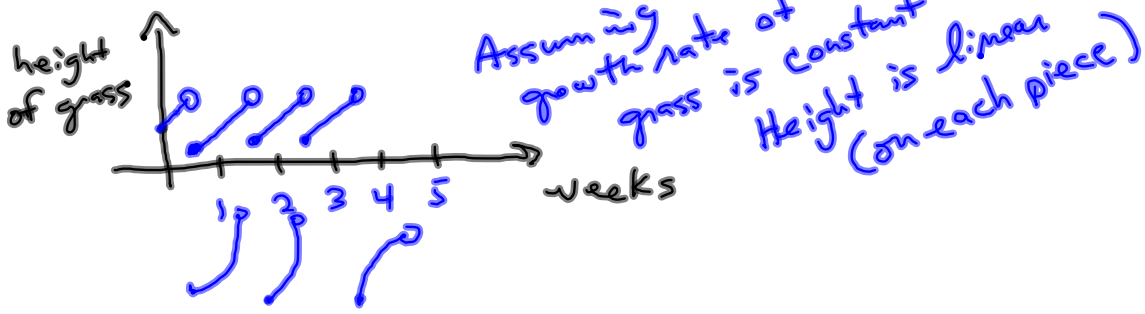
§1.1 Summary:

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

READ YOUR BOOK!



§1.1 #17



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

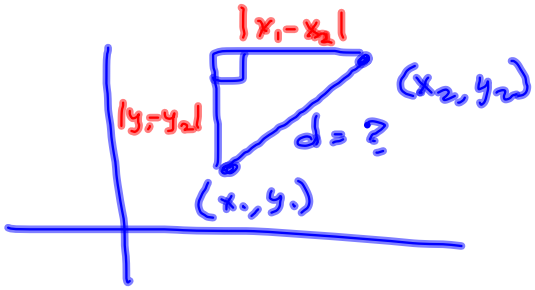
$$(x-h)^2 + (y-k)^2 = r^2$$

Circle is set of points equidistant from a fixed point.

(h,k) r

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 $(y+3)^2$

.. $y+3$

.. y

$(y+3)^2 = 25 - (x-2)^2$

$\sqrt{(y+3)^2} = \sqrt{25-(x-2)^2}$

$|y+3| = \sqrt{25-(x-2)^2}$

$y+3 = \pm\sqrt{25-(x-2)^2}$

$y = -3 \pm \sqrt{25-(x-2)^2}$

$\sqrt{(y+3)^2} = |y+3|$

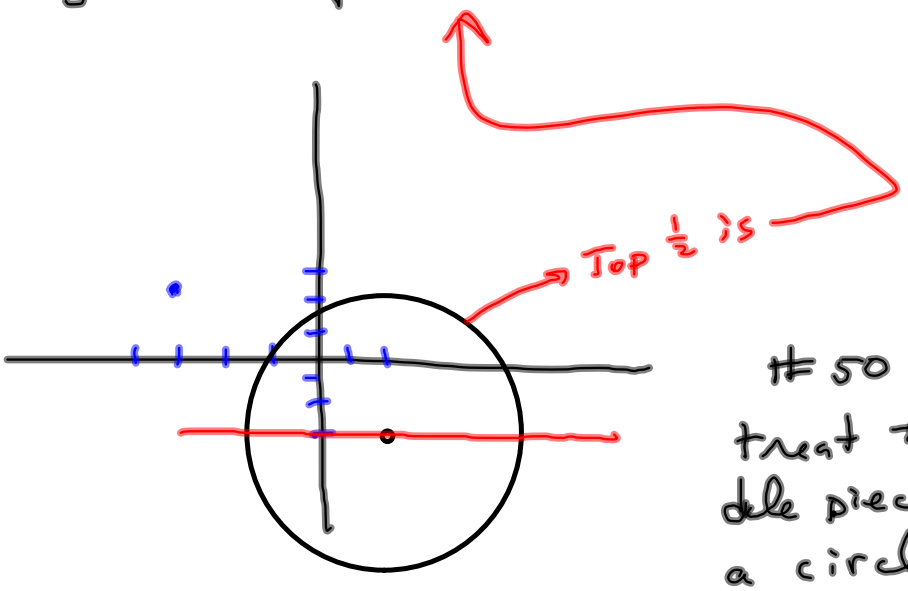
$\sqrt{3^2} = 3$

$\sqrt{(-3)^2} = 3$

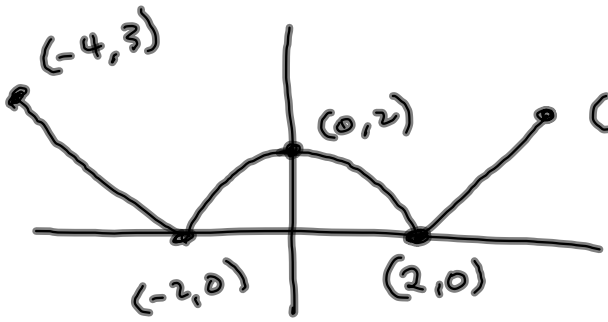
$$\sqrt{x^2} = \begin{cases} x & \text{if } x \geq 0 \\ -x & \text{if } x < 0 \end{cases} = |x|$$

$|x| = 5$ means $x = 5$ OR $x = -5$, i.e., $x = \pm 5$

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



50 on 8.1, treat the middle piece like a circle.



Describe algebraically.

$$f(x) = \begin{cases} \_\_\_\_\_ & -4 \le x < -2 \\ \_\_\_\_\_ & -2 \le x < 2 \\ \_\_\_\_\_ & 2 \le x \le 4 \end{cases}$$

$f(t) = t^2 - 6t$ Give Terry more credit for this Graph. State $D \& R$

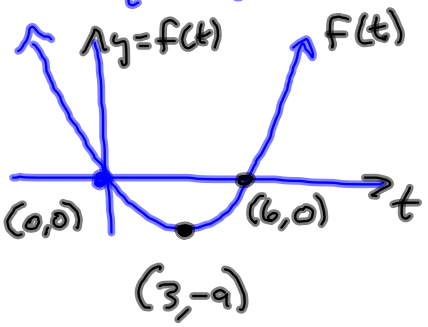
① $t^2 - 6t = 0$

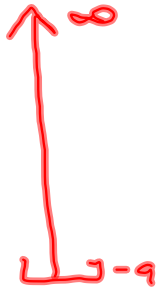
$t(t-6) = 0$

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

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

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





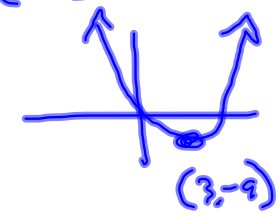
② $f(t) = t^2 - 6t$

$= t^2 - 6t + 3^2 - 3^2$

$= (t-3)^2 - 3^2$

$= (t-3)^2 - 9$

$(h, k) = (3, -9)$



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

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

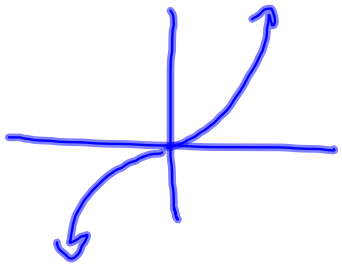
$R = [-9, \infty)$

§1.1

§1.2 Due Friday Read it Start it.

Diagnostic Test - Peck away

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



ac method

$|x^2+3x+2$

Factors of $(1)(2)=2$ that add up to 3.

Try $(1)(2)=2$

$1+2=3$ ✓

$x^2+1x+2x+2$

Factor each piece

$= x(x+1)+2(x+1)$

Factor out $x+1$

$=(x+1)(x+2)$

Pascal's Triangle

1

1 1

1 2 1

1 3 3 1

Binomial Theorem

$(3x+2y)^3 = 1(3x)^3(2y)^0 + 3(3x)^2(2y)^1 + 3(3x)^1(2y)^2 + 1(3x)^0(2y)^3$

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

$= 27x^3 + 54x^2y + 36xy^2 + 8y^3$

$(a+b)^3 = 1a^3b^0 + 3a^2b^1 + 3ab^2 + 1a^0b^3$

$= a^3 + 3a^2b + 3ab^2 + b^3$

The 1, 3, 3, 1 are the "binomial coefficients"

$$(5x-7y)^5 = 1(5x)^5(-7y)^0 + 5(5x)^4(-7y)^1 + 10(5x)^3(-7y)^2 + 10(5x)^2(-7y)^3 + 5(5x)^1(-7y)^4 + 1(5x)^0(-7y)^5$$

$$= 5^5x^5 - 5\cdot5^4x^4\cdot7y + 10\cdot5^3x^3\cdot7^2y^2 - 10\cdot5^2x^2\cdot7^3y^3 + 5\cdot5x\cdot7^4y^4 - 7^5y^5$$

$$= 3125x^5 - 21875x^4y + 61250x^3y^2 - 85750x^2y^3 + 60025xy^4 - 16807y^5$$

1
1 1
1 2 1
1 3 3 1
1 4 6 4 1
1 5 10 10 5 1

$6^2 25$ → 5 → $31^1 25$ → 7 → 21875

$1^3 250$ → 7 → $5^3 8750$ → 7 → 61250

$6\,49$ → 7 → $2\,343$ → 7 → $239\,1 = 7^4$

$2\,3^1 43$ → 250 → 17150