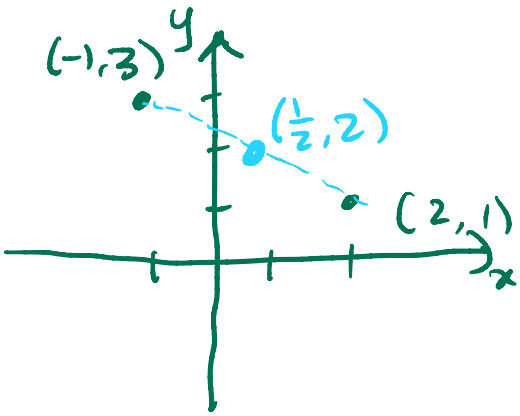
Name: Key GTID: _____

Answer the questions in the spaces provided and BOX your answer. Organize and show your work for full credit.

1a. Find the midpoint between $(-1, 3)$ and $(2, 1)$.
Hint: use a sketch to check your answer.



midpoint is $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

$= \left(\frac{-1+2}{2}, \frac{3+1}{2}\right)$

$= \boxed{\left(\frac{1}{2}, 2\right)}$

1b. Find the equation of the line passing through $(-1, 3)$ and $(2, 1)$.
Hint: these are the same points from #1a.

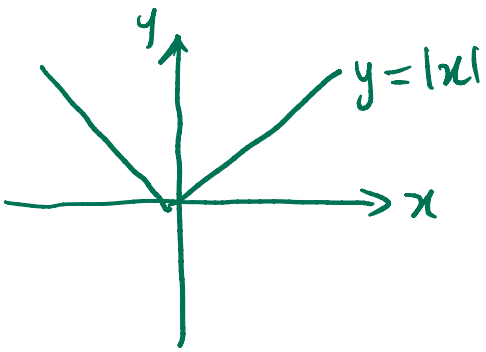
$m = \frac{y_2-y_1}{x_2-x_1} = \frac{1-3}{2-(-1)} = \frac{-2}{3}$

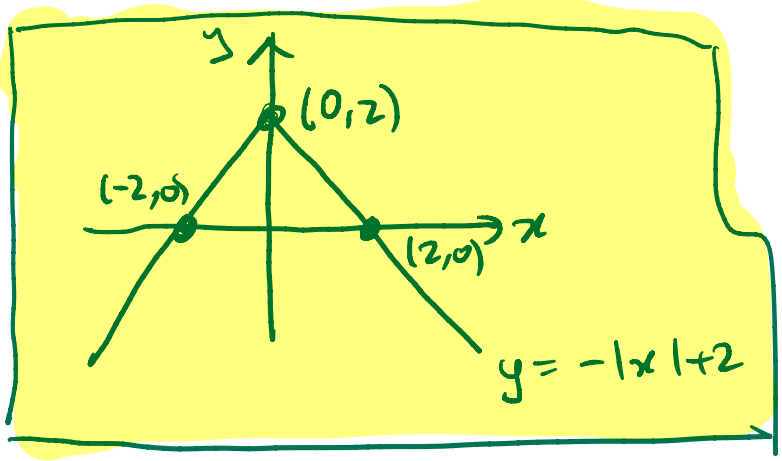
$\boxed{y = \frac{-2}{3}x + \frac{7}{3}}$

$y = \frac{-2}{3}x + b$ plug in $(-1, 3)$

$3 = -\frac{2}{3}(-1) + b \Rightarrow 3 = \frac{2}{3} + b \quad b = 3 - \frac{2}{3} = \frac{9-2}{3} = 7/3$

2. Graph: $y = -|x| + 2$
Hint: transform the graph of $y = |x|$ using the techniques from class.





3. Find the domain of $f(x) = \frac{x^2-9}{\sqrt{4-x}}$.

need $4-x \geq 0 \implies x \leq 4$

and also $\sqrt{4-x} \neq 0 \Rightarrow 4-x \neq 0 \implies x \neq 4$.

So if $x \leq 4$ and $x \neq 4$, then **D: $x < 4$**

or D: $(-\infty, 4)$

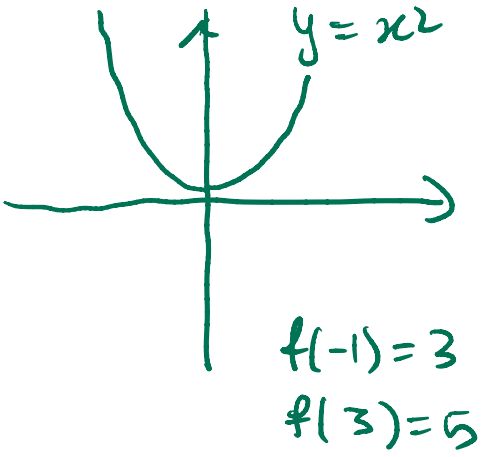
4. Suppose $f(x) = x^2 - x + 1$ and $g(x) = \sqrt{x-1}$, and find $f(g(5))$.

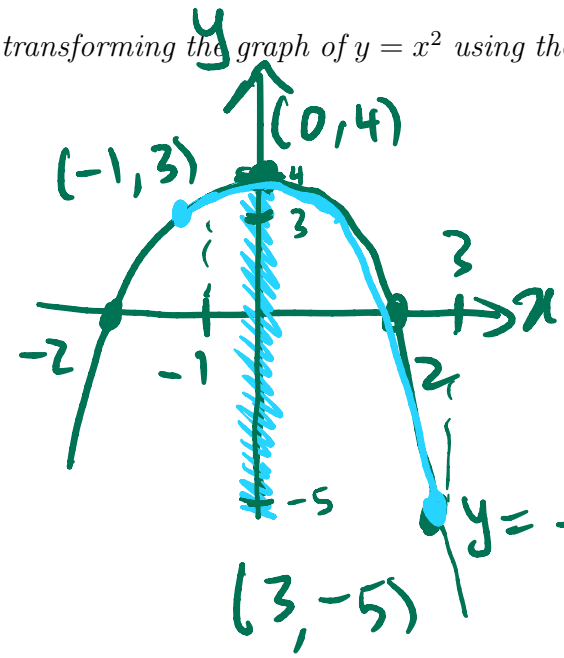
$g(5) = \sqrt{5-1} = \sqrt{4} = 2$

$f(g(5)) = f(2) = 2^2 - 2 + 1 = 4 - 1 = 3$

$f(g(5)) =$ **3**

5. Given the function $f(x) = -x^2 + 4$ with domain D : $[-1, 3]$, what is the range of the function on this interval?
Hint: sketch the function by transforming the graph of $y = x^2$ using the techniques from class.





range is **[-5, 4]**