27. $|x^2 - 8| = 1$

$x^2 - 8 = 1$ or $x^2 - 8 = -1$

$+8 \quad +8$ $\quad +8 \quad +8$

$\sqrt{x^2} = \sqrt{9}$ $\quad x^2 = 7$

$x = \pm 3$ $\quad x = \pm\sqrt{7}$

$|(\sqrt{7})^2 - 8| = |-1|$

$= 1$

55. $|x-4| - 2 \geq 6$

$+2 \quad +2$

$|x-4| \geq 8$

$x - 4 \leq -8$ or $x - 4 \geq 8$

57. $|3x+7| - 2 < 8$

$+2 \quad +2$

$|3x+7| < 10$

$-10 < 3x + 7 < 10$

$-7 \quad -7 \quad -7$

$-\frac{17}{3} < \frac{3x}{3} < \frac{3}{3}$

$-\frac{17}{3} < x < 1$ $\quad \left(-\frac{17}{3}, 1\right)$

Section 2.6: Piecewise-Defined Functions

example: $f(x) = \begin{cases} x+3 & \text{if } x < -1 \\ -2x-3 & \text{if } x \geq -1 \end{cases}$

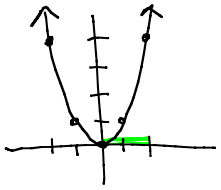
Use $f(x) = x+3$ → $f(-2) = -2+3 = 1$

2nd function → $f(5) = -2(5) - 3 = -10 - 3 = -13$

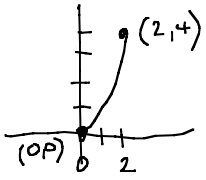
$f(-1) = -2(-1) - 3 = 2 - 3 = -1$

Graphing Piecewise-Defined Functions

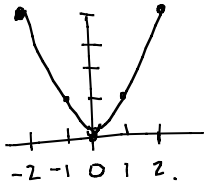
example: Graph $f(x) = x^2$



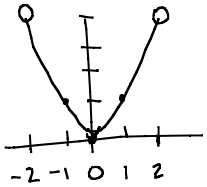
Graph $f(x) = x^2$, if $0 \leq x \leq 2$



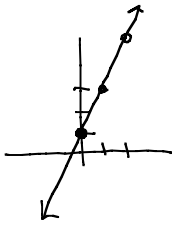
Graph $f(x) = x^2$, if $-2 \leq x \leq 2$



Graph $f(x) = x^2$, if $-2 < x < 2$

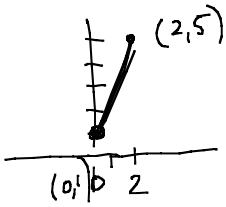


Graph $f(x) = 2x + 1$

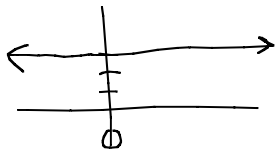


x	f(x)
0	1
1	3
2	5

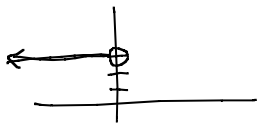
Graph $f(x) = 2x + 1$, if $0 \leq x \leq 2$



Graph $f(x) = 3$

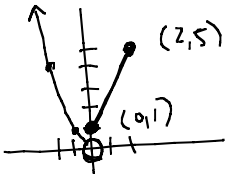


Graph $f(x) = 3$, if $x < 0$



example: Graph $f(x) = \begin{cases} x^2, & \text{if } x < 0 \\ 2x+1, & \text{if } 0 \le x \le 2 \end{cases}$ ←

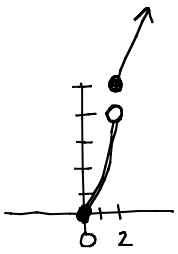
↑ line

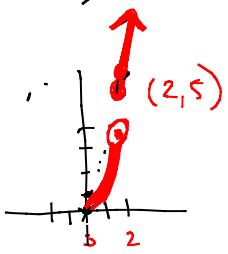


x	f(x)
0	1
2	5

example: Graph $f(x) = \begin{cases} x^2, & \text{if } 0 \le x < 2 \\ 2x+1, & \text{if } x \ge 2 \end{cases}$

"x is between 0 and 2"





x	f(x)
0	1
1	3
2	5

∴

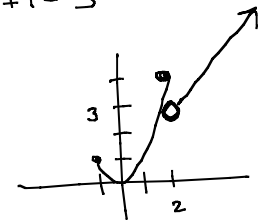
example: $f(x) = \begin{cases} x^2, & \text{if } -1 \le x \le 2 \\ x+1, & \text{if } x > 2 \end{cases}$

① $f(-1) = (-1)^2 = 1$

$f(2) = (2)^2 = 4$

x	f(x)
-1	1
2	4

② $f(2) = 2+1 = 3$



x	f(x)
2	3

Section 2.6 Pg 200

(20), 22, 24, 29, 30

Greatest Integer Function

$f(x) = [[x]] = \text{int}(x)$ = greatest integer that is less than or equal to x.

Integers: .... -2, -1, 0, 1, 2 ....

$f(1.5) = 1$

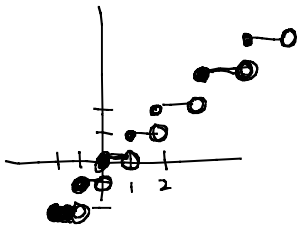
$f(0.5) = 0$

$f(-0.5) = -1$

$f(1) = 1$

$f(2) = 2$

x	f(x)
-2	-2
-1.5	-2
-1.3	-2
-1.1	-2
-1	-1
-0.5	-1
0	0



Section 2.6 : 1-29 (odd)