

COMPLETE EACH OF THE FOLLOWING, WITH YOUR GROUP, WITHOUT A CALCULATOR

FUNCTION: ①  $y = \frac{1}{x-4}$  ②  $y = \frac{1}{x+2} + 4$  To which function Family does your function belong?

For your function, find:  $\uparrow$  Rational  $\uparrow$  Rational

Domain:  $(-\infty, 4) \cup (4, \infty)$   $(-\infty, -2) \cup (-2, \infty)$

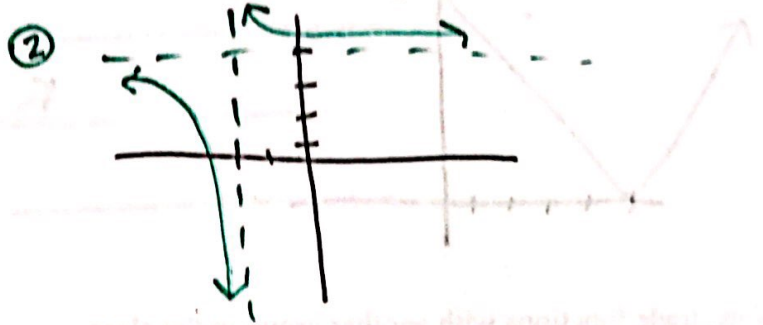
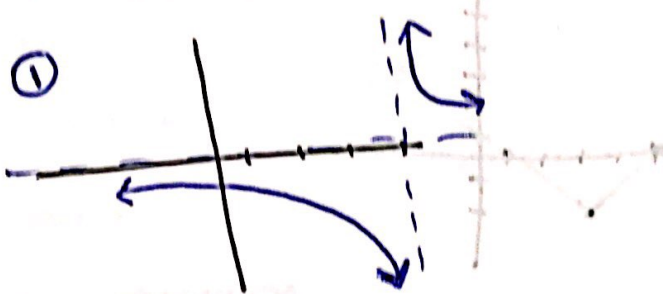
Range:  $(-\infty, 0) \cup (0, \infty)$   $(-\infty, 4) \cup (4, \infty)$

Extrema (maximum/minimum): none none

x-intercept: none  $(-9/4, 0)$

y-intercept:  $(0, -1/4)$   $(0, 9/2)$

Sketch a graph of your function:



Now, trade functions with another group in the class.

FUNCTION: ③  $y = -x^3 + 1$  ④  $y = (x+4)^2 - 1$  To which function Family does your function belong?

For your function, find:  $\uparrow$  cubic  $\uparrow$  quadratic

Domain:  $(-\infty, \infty)$   $(-\infty, \infty)$

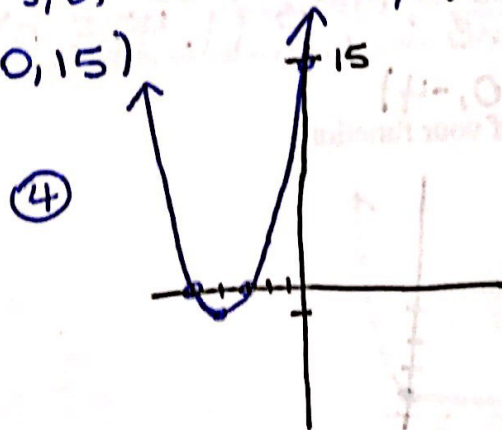
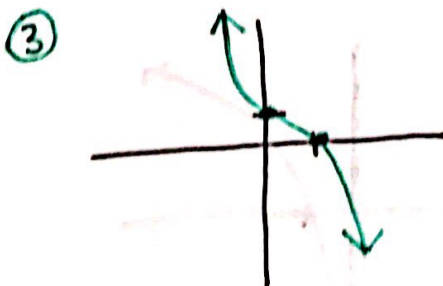
Range:  $(-\infty, \infty)$   $[-1, \infty)$

Extrema (maximum/minimum): none min. @  $(-4, -1)$

x-intercept:  $(1, 0)$   $(-3, 0)$  and  $(-5, 0)$

y-intercept:  $(0, 1)$   $(0, 15)$

Sketch a graph of your function:



Now, trade functions with another group in the class.

FUNCTION: ⑤  $y = 3|x+5|$  ⑥  $y = |x+3| - 2$  To which function Family does your function belong?

For your function, find:

Domain:  $(-\infty, \infty)$

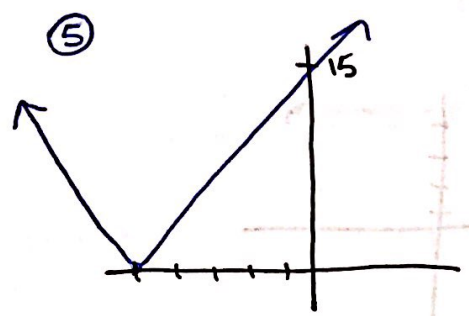
Range:  $[0, \infty)$

Extrema (maximum/minimum): Min. @  $(-5, 0)$

x-intercept:  $(-5, 0)$

y-intercept:  $(0, 15)$

Sketch a graph of your function:



Absolute Value

Absolute Value

$(-\infty, \infty)$

$[-2, \infty)$

Min. @  $(-3, -2)$

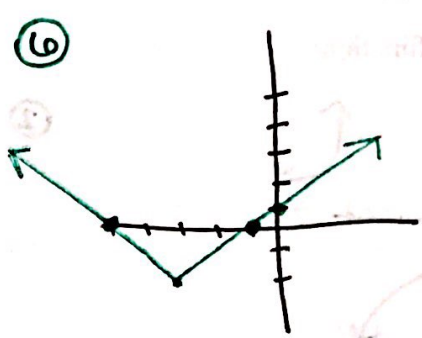
$(-5, 0), (-1, 0) \leftarrow 0 = |x+3| - 2$

$(0, 1)$

$2 = x + 3 \quad 2 = -(x+3)$

$x = -1 \quad 2 = -x - 3$

or  $x = -5$



Now, trade functions with another group in the class.

FUNCTION: ⑦  $y = 3^x - 5$  ⑧  $y = \log x$  To which function Family does your function belong?

For your function, find:

Domain:  $(-\infty, \infty)$

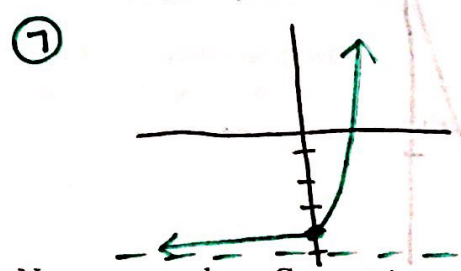
Range:  $(-5, \infty)$

Extrema (maximum/minimum): none

x-intercept:  $(\frac{\ln 5}{\ln 3}, 0) \rightarrow (1.465, 0)$

y-intercept:  $(0, -4)$

Sketch a graph of your function:



Exponential

Logarithmic

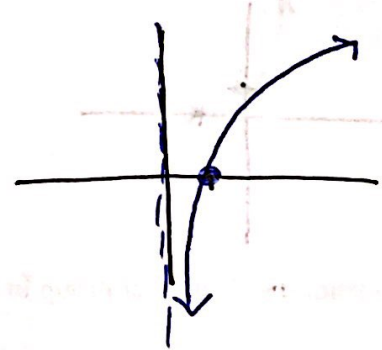
$(0, \infty)$

$(-\infty, \infty)$

none

$(1, 0)$

no y-int.



Now, you are done. Congrats!