

Wed. Week 5

Asymptotes / Graphs

degree: highest exponent in a poly

Thurs - exams returned

Fri. - mental health day

<p>VERTICAL</p> <p>occur where: den = 0 & num ≠ 0</p>	<p>HORIZONTAL</p> <p>① degree of num < degree of den, ⇒ H.A. @ $y = 0$</p> <p>② degree of num = degree of den ⇒ $y = \frac{a}{b}$ w/ $\frac{a}{b}$ = ratio of leading terms</p>	<p>SLANT</p> <p>occur when degree num = degree denom + 1</p>
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Warm-up: Find asymptotes: (vert. + horiz)

① $\frac{(2x-1)(3x-4)(x+1)}{x^2-1} = f(x) = \frac{(2x-1)(3x-4)(x+1)}{(x-1)(x+1)}$ $\frac{1}{2}, \frac{4}{3}, -1$

→ zeros: ± 1

Numerator: degree = 3 } **NO HORIZ. ASY**
 Denom: degree = 2

$x = 1$
vertical
 asy

Leading Term: $2x \cdot 3x \cdot x = 6x^3$
 num

$\frac{6x^3}{x^2} = 6x =$

$y = 6x$
slant
 asy

Leading Term: x^2
 denom

② Factor to see the zeros of the numerator

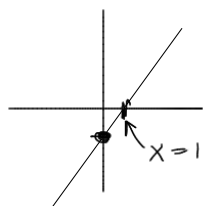
$$\frac{x^2 - 6x + 5}{(x-3)(x-1)} = g(x) = \frac{(x-5)(x-1)}{(x-3)(x-1)} = \frac{x-5}{x-3}$$

Vertical: $x = 3$

Ratio of Leading Terms: $\frac{x}{x} = 1 \Rightarrow$ Horiz. Asy @ $y = 1$

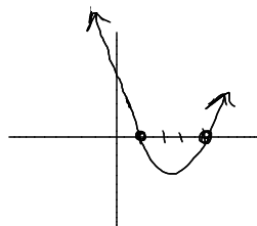
Build a function up from scratch using specified criteria.

Consider: $y = x - 1$



zeros of function
 \updownarrow
 where graph crosses x-axis

$y = (x-1)(x-4)$
 degree 2 \Rightarrow \uparrow or \downarrow
 leading + leading -



Ex. Find the formula for a quadratic function that: zeros: -3, 5

graph contain the point $(0, 8)$ $f(x)$

① Get zeros: $(x - (-3)) \cdot (x - 5)$

② Point: $f(x) = c \cdot (x - (-3))(x - 5)$

$f(x) = c(x+3)(x-5)$ plus in $x=0$
 $f(x) = 8$

$8 = c \cdot (0+3)(0-5)$
 $8 = c \cdot (-15) \Rightarrow c = -8/15$

③ $f(x) = -\frac{8}{15}(x+3)(x-5) = -\frac{8}{15}(x^2 - 2x - 15)$

$f(x) = -\frac{8}{15}x^2 + \frac{16x}{15} + 8$