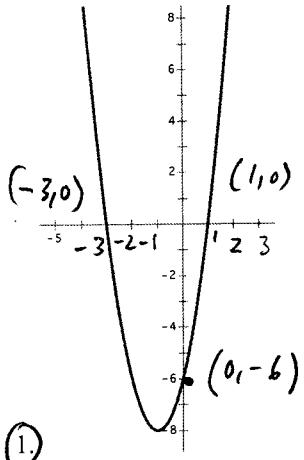
Sheet 951: Finding Formulas of Polynomial and Rational Functions from their Graphs

Name: KEY



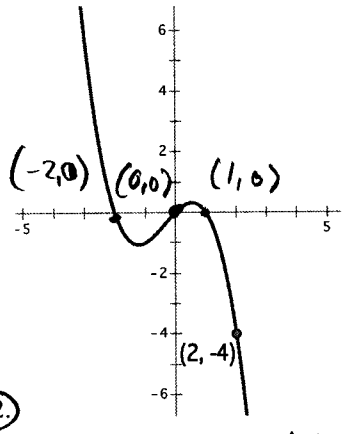
1.

$y = A(x-1)(x+3)$

$-6 = A(-1)(3)$

$A = 2$

$\boxed{y = 2(x-1)(x+3)}$



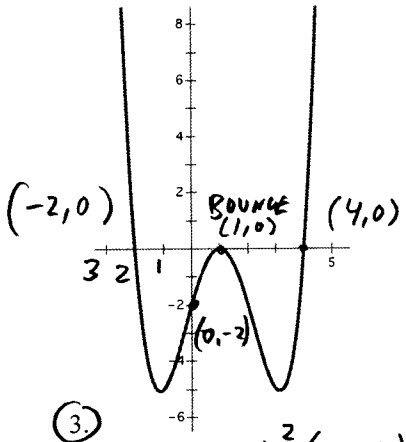
2.

$y = Ax(x+2)(x-1)$

$-4 = A(2)(4)(1)$

$A = -\frac{1}{2}$

$\boxed{y = -\frac{1}{2}x(x+2)(x-1)}$



3.

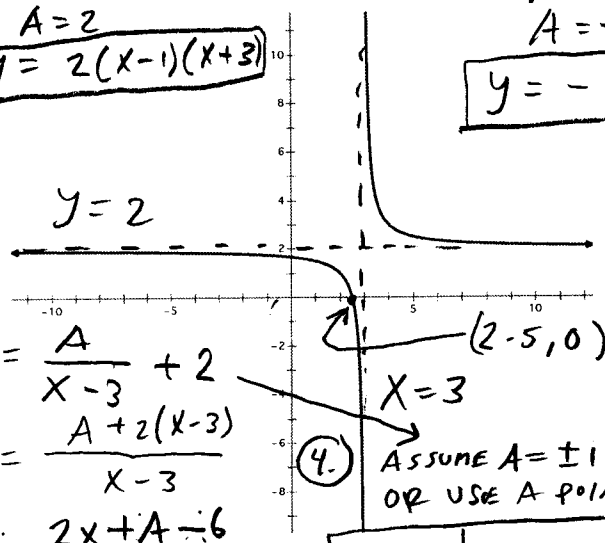
$y = A(x-1)^2(x-4)(x+2)$

$-2 = A(-1)^2(-4)(2)$

$-2 = A(-8)$

$A = \frac{1}{4}$

$\boxed{y = \frac{1}{4}(x-1)^2(x-4)(x+2)}$



4.

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

$y = \frac{A + 2(x-3)}{x-3}$

$y = \frac{2x + A - 6}{x+3}$

Zero: (2.5,0)

$0 = 2(2.5) + A - 6$

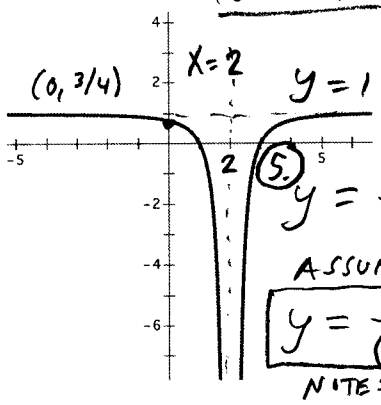
$0 = A - 1$

$A = 1$

(4.) ASSUME $A = \pm 1$ OR USE A POINT.

$\boxed{y = \frac{1}{x-3} + 2}$

$\boxed{y = \frac{2x-5}{x-3}}$



5.

(5.) $y = \frac{A}{(x-2)^2} + 1$

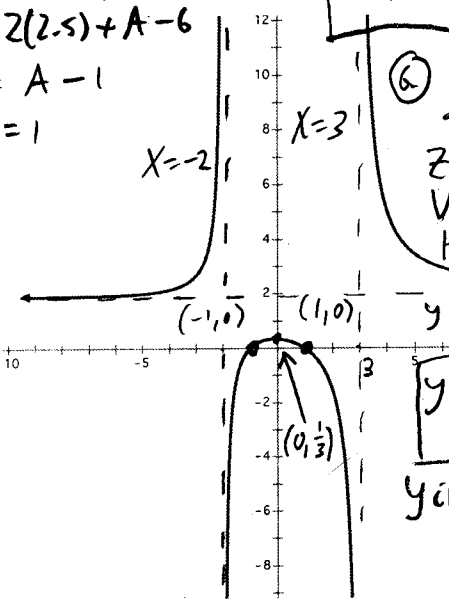
ASSUME $A = \pm 1$

$\boxed{y = \frac{-1}{(x-2)^2} + 1}$

NOTE: (1,0) IS ON GRAPH

$y = \frac{-1 + (x-2)^2}{(x-2)^2}$

$\boxed{y = \frac{x^2 - 4x + 3}{x^2 - 4x + 4}}$



6.

(6.) $y = \frac{A(x+1)(x-1)}{(x+2)(x-3)}$

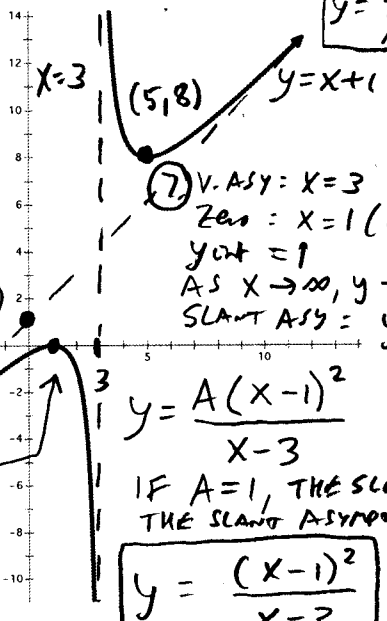
Zeros: $x = -1, x = 1$

V. Asy: $x = -2, x = 3$.

H. Asy: $y = 2$. So $A = 2$

$\boxed{y = \frac{2(x+1)(x-1)}{(x+2)(x-3)}}$

$y_{int} = \frac{-2}{-6} = \frac{1}{3}$ ✓



7.

(7.) V. Asy: $x = 3$

Zero: $x = 1$ (bounce)

$y_{int} = 1$

As $x \to \infty$, $y \to x+1 \to x \to \infty$

Slant Asy: $y = x + 1$

$y = \frac{A(x-1)^2}{x-3}$

IF $A = 1$, THE SLOPE OF THE SLANT ASYMPTOTE = 1.

$\boxed{y = \frac{(x-1)^2}{x-3}}$