

Pre-Calculus 12 Polynomial Functions

Label!!
scale ✓

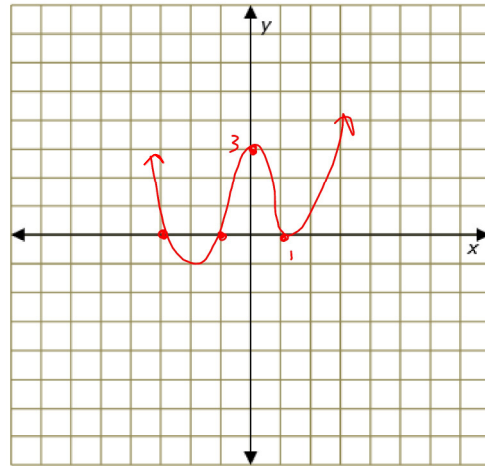
Ex. 1) Sketch the graph: $g(x) = (x + 3)(x + 1)(x - 1)^2$

① y-int $g(0) = (0+3)(0+1)(0-1)^2 = 3$

x-int $-3, -1, 1$ ↙ bounce

② degree 4 → even same end behav

lead coeff 1 → +ve
rise right
rise left



Ex. 2) Sketch the graph: $f(x) = -x^3 + 5x^2 + 2x - 24$

$f(x) = -x^3 + 5x^2 + 2x - 24$
 $f(-2) = 0 \therefore x+2$ is a factor

$$\begin{array}{r|rrrr} -2 & -1 & 5 & 2 & -24 \\ & \downarrow & & & \\ \hline & -1 & 7 & -12 & 0 \end{array}$$

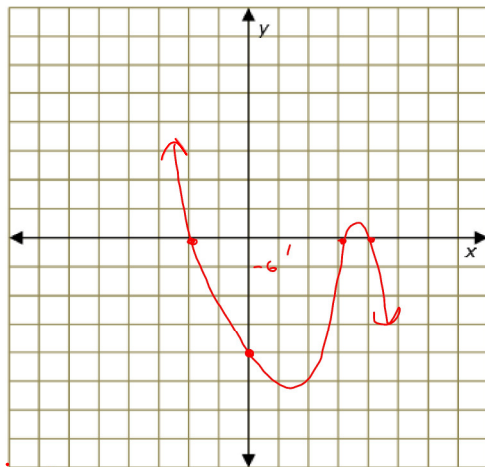
$f(x) = (x+2)(-x^2 + 7x - 12)$

$f(x) = -(x+2)(x^2 - 7x + 12)$

$= -(x+2)(x-4)(x-3)$

y-int $f(0) = -24$

degree 3 → odd
lead coeff -ve
falls right
rises left

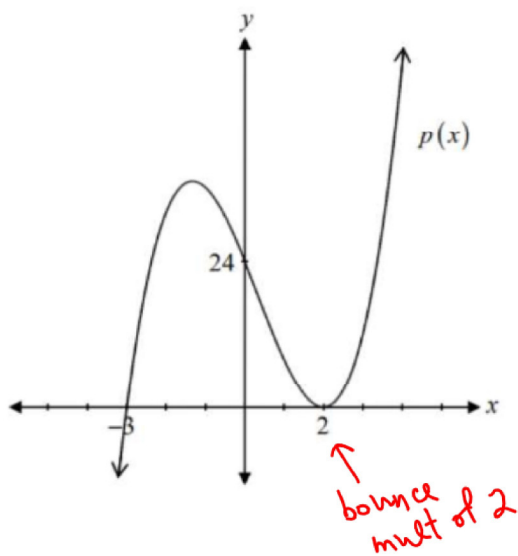


When a zero has even multiplicity, the graph touches the x-axis at the related x-intercept, but does not cross it. (bounces)

When a zero has odd multiplicity, the graph flattens out and crosses the x-axis at the related x-intercept.

Sketching Poly Fcns again.notebook

Ex. Determine the equation of the polynomial function, $p(x)$.



$$p(x) = a(x+3)(x-2)^2$$

$$24 = a(0+3)(0-2)^2$$

$$24 = 12a$$

$$2 = a$$

$$\therefore p(x) = 2(x+3)(x-2)^2$$

x-ints
-3, 2

y-int
pt

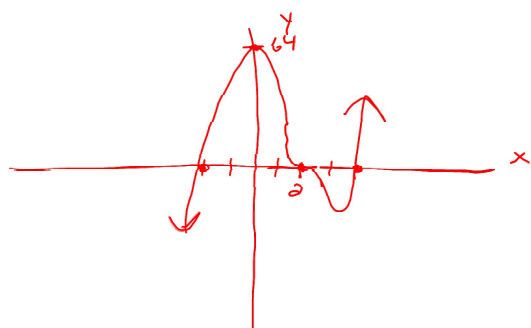
(0, 24)
x y

sub in

Sketching Poly Fcns again.notebook

$$y = (x-2)^3(x+2)(x-4)$$

y-int
64
x-int
2, -2, 4
↑
flattens,
then
crosses
deg 5
opp end
behav



pg. 148
3, 5,
7a
8b, d, e