

Quiz

$$\textcircled{1} \quad 64 - 25x^2 = 8^2 - \underbrace{(5x)^2}_{\substack{\downarrow \\ (5x)^2 \neq 5x^2}} \\ = (8 - 5x)(8 + 5x)$$

$$\textcircled{2} \quad \begin{array}{l} x^3 + 8 \\ x^3 + 2^3 \end{array} = (\underbrace{x+2}) (x^2 - 2x + 4)$$

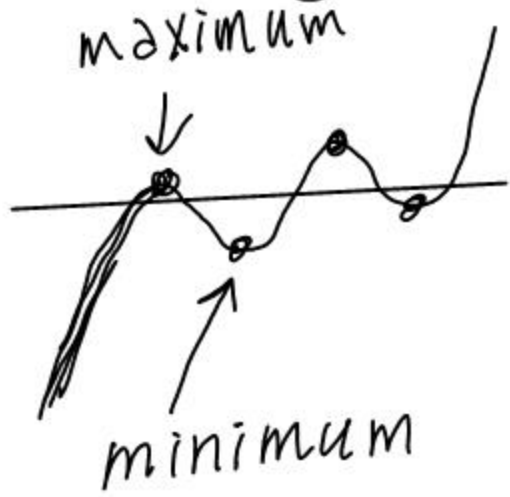
$$\textcircled{3} \quad \begin{array}{l} 27x^3 - 125 \\ (3x)^3 - 5 \end{array} = (\underbrace{3x-5}) (9x^2 + 15x + 25)$$

$$\textcircled{4} \quad \begin{array}{l} x^4 - 13x^2 + 36 \\ (x^2 - 4)(x^2 - 9) \\ \swarrow \quad \searrow \\ (x-2)(x+2)(x-3)(x+3) \end{array}$$

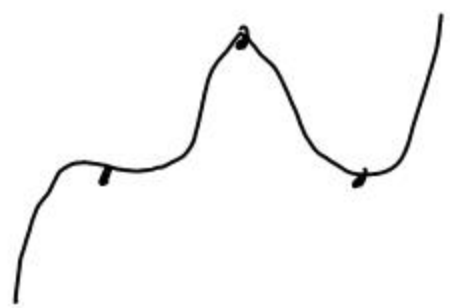
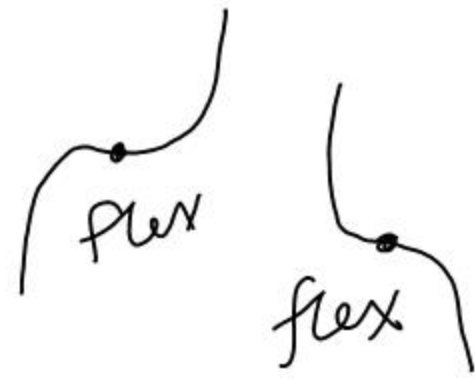
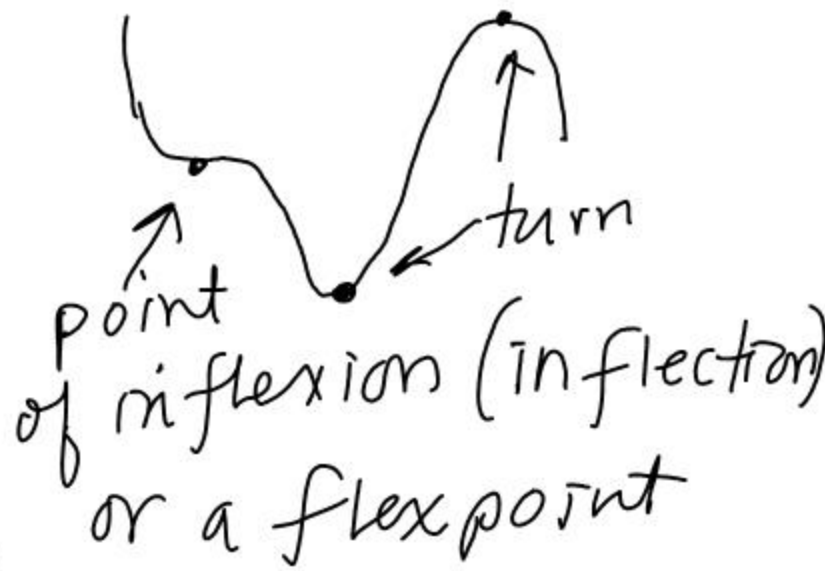
Draw the possible shapes

• Ex. $y = x^5 - 3x + 4$ ← odd degree

4 turns
2 turns
0 turns



A max or a min
is an extremum
(pl. extrema)
turns = extrema



How many zero?
1 - 5

• Ex $y = x^4 - x^2$

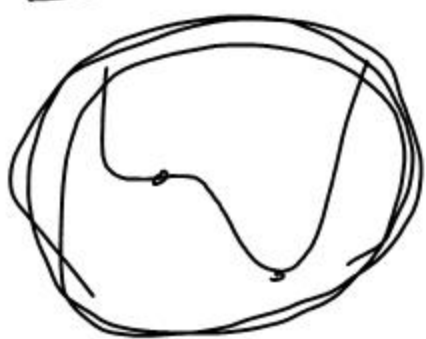
turns
3 - 1

possible shapes:

Number of
zeros:



0 - 4



Actual Graph (nearly)

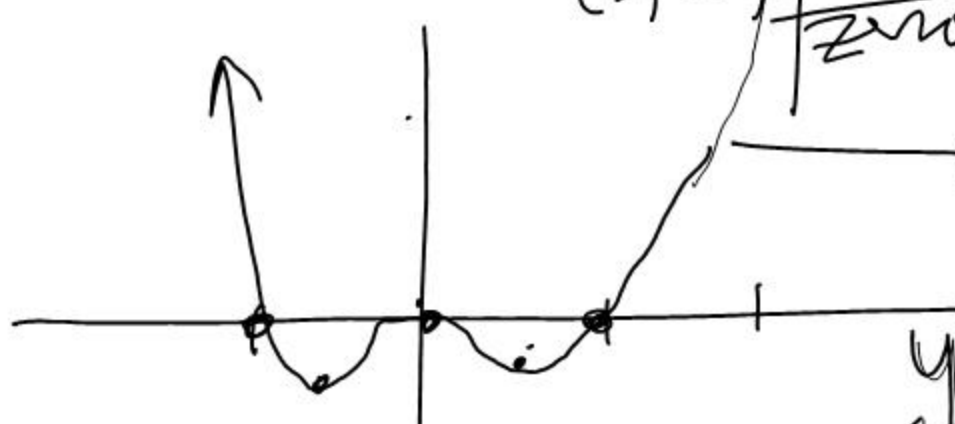
$$y = x^2(x^2 - 1) = x^2(x-1)(x+1)$$

(2, 12)

zeros: 0, 1, -1

real zeros

= x-intercepts



$$y(2) = 2^4 - 2^2$$

$$= 16 - 4$$

$$= 12$$

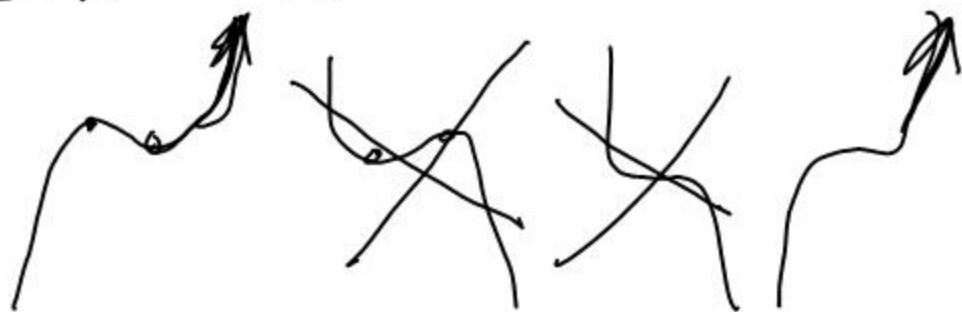
double roots = flex point

Worksheet

$$100^3 = 1,000,000$$
$$100^2 = 10,000$$

[10] $x^3 + 2x^2 - x + 4$

(c) 2 or 0 turns



(a) $y \rightarrow \infty$

because the coefficient of x^3 is +

(b) $y \rightarrow -\infty$

(d) 1 - 3


(c) neither mix of odd + even exponents)

(9) 1

$$[9] \quad 1 - x^4 - \underline{5x^8}$$

(c) turns: 7 or 5 or 3 or 1

(a) as $x \rightarrow \infty$, $y \rightarrow -\infty$
(right)



(b) as $x \rightarrow -\infty$, $y \rightarrow -\infty$
(left)

(d) even polynomial

HW: Polynomial Function
+ their graphs

2-14