

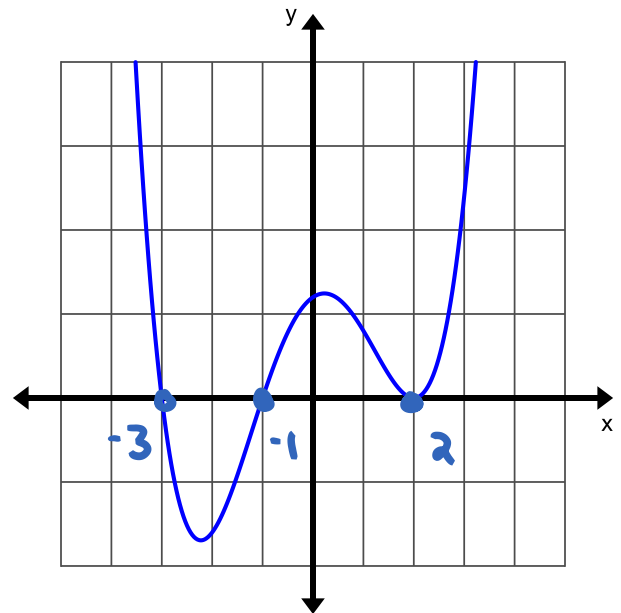
1.) What is true about the degree and leading coefficient of the polynomial function shown below.

(a) Degree is odd ; leading coefficient is positive

(b) Degree is odd ; leading coefficient is negative

(c) Degree is even ; leading coefficient is positive

(d) Degree is even ; leading coefficient is negative

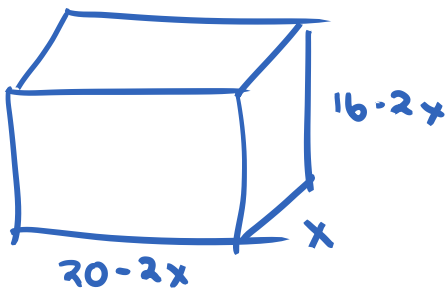


$$y = (x+3)(x+1)(x-2)^2$$

4 zeros  $\rightarrow$  degree is even

2.) A rectangular box has the following dimensions:  $x$ ,  $20 - 2x$ ,  $16 - 2x$ .

If we know that the volume of the box is no more than 500 inches<sup>3</sup>, find the **relative maximum** of the volume to find the missing dimension,  $x$ . (Round to the *nearest hundredth*)



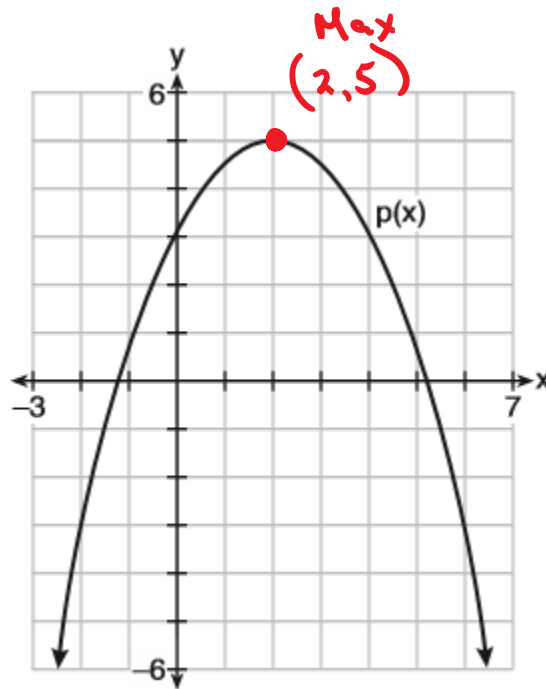
$$V = x(20 - 2x)(16 - 2x)$$

$$\text{Max } (2.94, 420.11)$$

$$x = 2.94$$

3.) Consider  $f(x) = 4x^2 + 6x - 3$ , and  $p(x)$  defined by the graph below.

$$\text{Min} (-1.75, -5.25)$$



The difference between the value of the maximum of  $p$  and minimum of  $f$  is

(a) 0.25

(b) 1.25

(c) 3.25

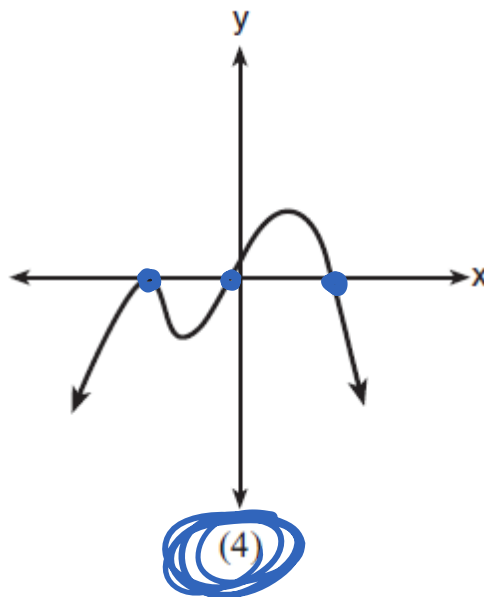
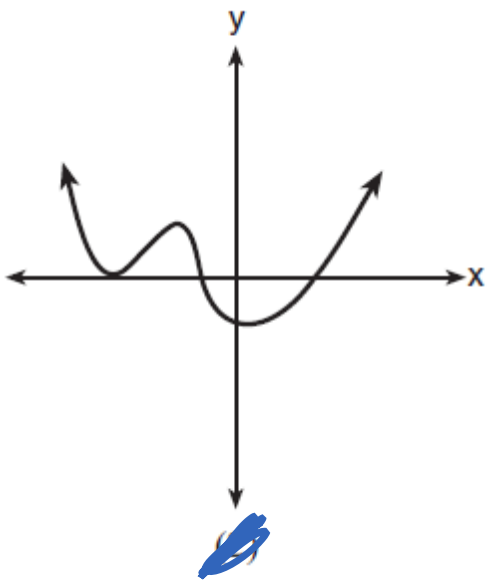
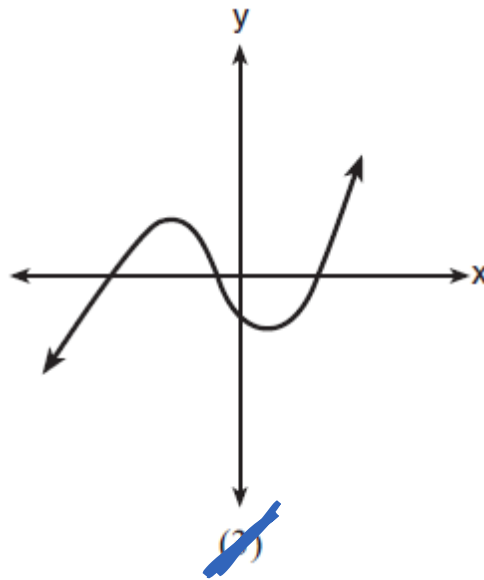
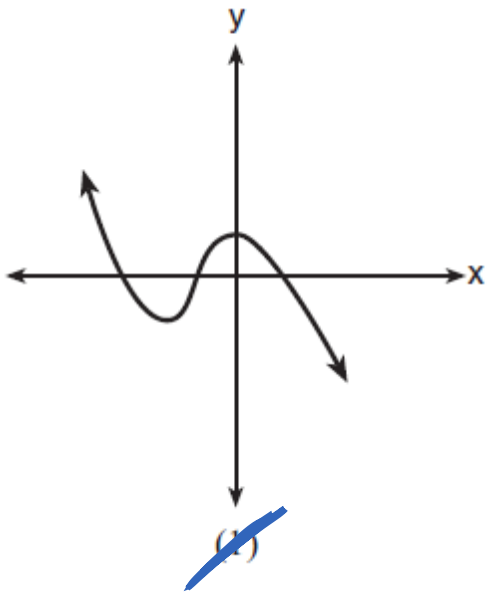
(d) 10.25

4.) Which graph has the following characteristics?

- Four real zeros

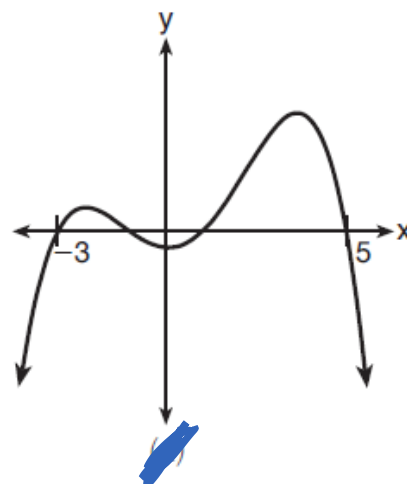
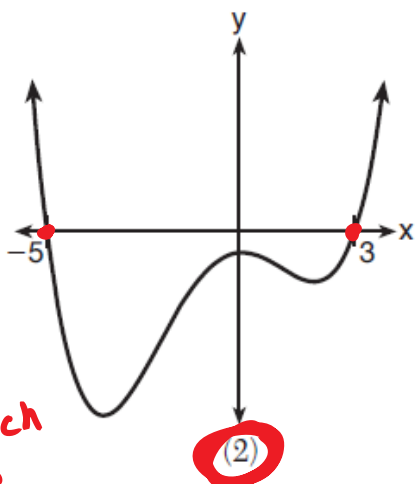
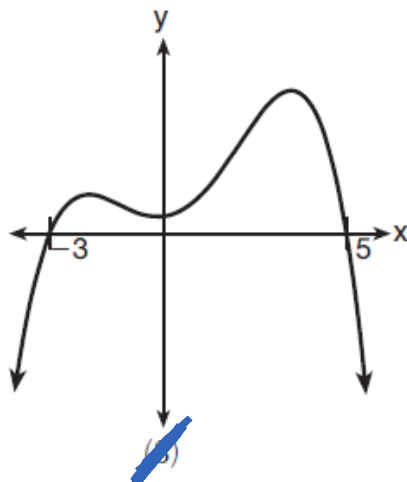
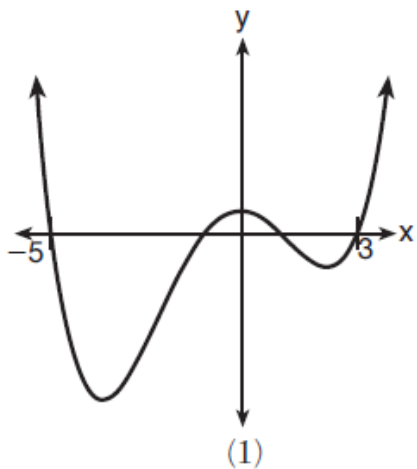
• as  $x \rightarrow -\infty$ ,  $f(x) \rightarrow -\infty$

- as  $x \rightarrow \infty$ ,  $f(x) \rightarrow -\infty$



5.) A 4<sup>th</sup> degree polynomial has zeros  $-5$ ,  $3$ ,  $i$  and  $-i$ .

Which graph could represent the function defined by this polynomial?



*i, -i  
don't touch  
x-axis*

6.) What are the zeros of  $P(m) = (m^2 - 4)(m^2 + 1)$ ?

(a) 2 and  $-2$ , only

(b) 2,  $-2$  and  $-4$

(c)  $-4$ ,  $i$  and  $-i$

(d) 2,  $-2$ ,  $i$  and  $-i$

$$(m-2)(m+2)(m^2+1) = 0$$

$$m-2=0$$

$$m+2=0$$

$$\begin{array}{l} m^2+1=0 \\ -1 \quad -1 \end{array}$$

$$\boxed{m=2}$$

$$\boxed{m=-2}$$

$$\frac{\quad}{\sqrt{m^2} = \sqrt{-1}}$$

$$m = \pm \sqrt{-1}$$

$$\boxed{m = \pm i}$$