

26. Which of the following equations *could* be of the graph presented below?

ZEROS:

1.  $x = -1$ , CROSSES X-AXIS

$\Rightarrow (x - (-1)) = (x + 1)$  IS  
A FACTOR WITH  
ODD MULTIPLICITY

2.  $x = 0$ , CROSSES X-AXIS

$\Rightarrow (x - 0) = x$  IS A  
FACTOR WITH ODD  
MULTIPLICITY

3.  $x = 2$ , CROSSES X-AXIS  $\Rightarrow (x - 2)$  IS A

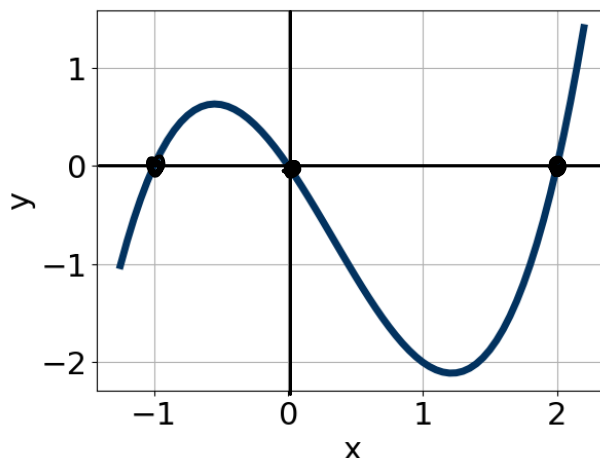
A.  $x(-x-1)(x-2)$

B.  $-x(x-2)(x+1)^2$

C.  $x(x-2)(x+1)^2$

D.  $x(x-2)(x+1)$

E.  $x^2(x-2)(x+1)^2$



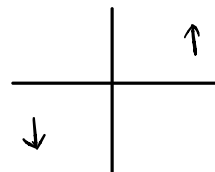
END BEHAVIOR:

★ "DEGREE" IS

$1 + 1 + 1 = 3$

$\Rightarrow$  ODD DEGREE

★ END BEHAVIOR IS



$\Rightarrow$  LEADING COEFF.  
IS POSITIVE

$\Rightarrow a = 1$

FACTOR WITH  
ODD MULTIPLICITY

$$f(x) = x(x+1)(x-2)$$

27. Choose the end behavior of the polynomial below.

$$f(x) = -7(x-9)^6(x-6)^8(x+6)^3(x+9)^5$$

★ LEADING COEFFICIENT

IS  $-7$

$\Rightarrow$  NEGATIVE

★ DEGREE IS

$6 + 8 + 3 + 5 = 22$

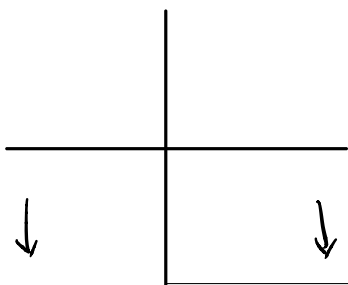
$\Rightarrow$  EVEN DEGREE

A.

B.

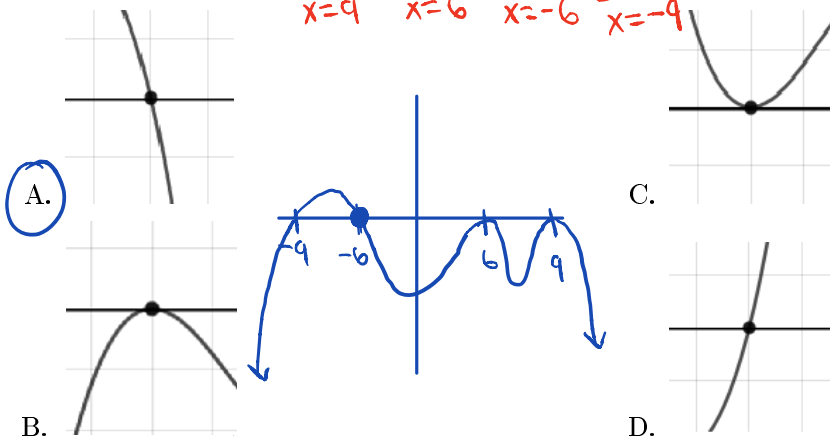
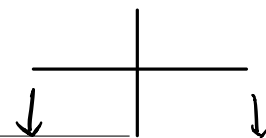
C.

D.



ZEROS:28. Describe the zero behavior of the zero  $-6$  of the polynomial below.1.  $x=9$  IS A ZERO  
WITH EVEN MULTIP.  
 $\Rightarrow$  TOUCHES2.  $x=6$  IS A ZERO  
WITH EVEN  
MULTIPLICITY  
 $\Rightarrow$  TOUCHES3.  $x=-6$  IS A ZERO  
WITH ODD MULT.  
 $\Rightarrow$  CROSSES4.  $x=-9$  IS A ZERO  
WITH ODD MULTIP.  $\Rightarrow$  CROSSES

$$f(x) = -7 \underbrace{(x-9)^6}_{x=9} \underbrace{(x-6)^8}_{x=6} \underbrace{(x+6)^3}_{x=-6} \underbrace{(x+9)^5}_{x=-9}$$

END BEHAVIOR:★ LEADING  
COEFFICIENT  
IS  $-7$   
 $\Rightarrow$  NEGATIVE★ DEGREE  
IS  
 $6+8+3+5=22$   
 $\Rightarrow$  EVEN29. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form  $ax^3 + bx^2 + cx + d$ .

$$\frac{-2}{5}, \frac{-7}{3}, \frac{-1}{3}$$

A.  $a \in [41, 49]$ ,  $b \in [97, 103]$ ,  $c \in [-17, -12]$ , and  $d \in [-17, -12]$ B.  $a \in [41, 49]$ ,  $b \in [-114, -107]$ ,  $c \in [-1, 7]$ , and  $d \in [5, 22]$ C.  $a \in [41, 49]$ ,  $b \in [-139, -137]$ ,  $c \in [79, 85]$ , and  $d \in [-17, -12]$ D.  $a \in [41, 49]$ ,  $b \in [137, 142]$ ,  $c \in [79, 85]$ , and  $d \in [-17, -12]$ E.  $a \in [41, 49]$ ,  $b \in [137, 142]$ ,  $c \in [79, 85]$ , and  $d \in [5, 22]$ 30. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form  $x^3 + bx^2 + cx + d$ .

$$3i \text{ and } -3$$

★ SINCE  $3i$  IS A ZERO, ITS  
COMPLEX CONJUGATE  $-3i$  IS  
ALSO A ZEROFACTORS:

1.  $x - 3i$

2.  $(x - (-3i)) = (x + 3i)$

3.  $(x - (-3)) = (x + 3)$

$$\Rightarrow f(x) = (x - 3i)(x + 3i)(x + 3)$$

$$f(x) = (x^2 + 9)(x + 3)$$

$$f(x) = x^3 + 3x^2 + 9x + 27$$

(29.) ZEROS:

$$1. x = -\frac{2}{5} \Rightarrow (x - (-\frac{2}{5})) = (x + \frac{2}{5}) \text{ IS A FACTOR}$$

↓ GET RID OF FRACTIONS

$$(x + \frac{2}{5} = 0)5 \Rightarrow 5x + 2 = 0$$

$\Rightarrow (5x+2)$  IS A FACTOR

$$2. x = -\frac{7}{3} \Rightarrow (x - (-\frac{7}{3})) = (x + \frac{7}{3}) \text{ IS A FACTOR}$$

↓ GET RID OF FRACTIONS

$$(x + \frac{7}{3} = 0)3 \Rightarrow 3x + 7 = 0$$

$\Rightarrow (3x+7)$  IS A FACTOR

$$3. x = -\frac{1}{3} \Rightarrow (x - (-\frac{1}{3})) = (x + \frac{1}{3}) \text{ IS A FACTOR}$$

↓ GET RID OF FRACTIONS

$$(x + \frac{1}{3} = 0)3 \Rightarrow 3x + 1 = 0$$

$\Rightarrow (3x+1)$  IS A FACTOR

$$f(x) = (5x+2)(3x+7)(3x+1)$$

$$f(x) = (15x^2 + 35x + 6x + 14)(3x+1)$$

$$f(x) = (15x^2 + 41x + 14)(3x+1)$$

$$f(x) = 45x^3 + 15x^2 + 123x^2 + 41x + 42x + 14$$

$$f(x) = 45x^3 + 138x^2 + 83x + 14$$