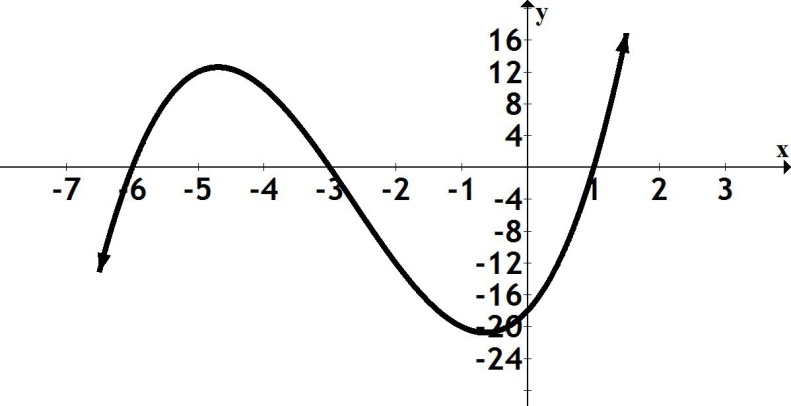
*Review 7.1-7.2(****Key****)*

1. Given graph:



a. Number of turning points:

b. Zeros:

c. Even or odd degree function: **Odd degree function; one end of the graph points up and the**

**other end points down.**

d. Leading coefficient positive or negative: **Positive; right-hand end of the graph points up.**

e. Equation of the function in factored form:

2. Given

a. Find the degree (without multiplying through).

**The given polynomial is equivalent to:**

**The degree is the sum of the degrees of the factors.**

**Add exponents: Degree is 6**

b. Find the zeros and state the multiplicity for each.

***Multiplicity* implies "how many times the zero occurs"**

**0**

**Multiplicity 1**

**Multiplicity 2 (notice exponent "2")**

**Multiplicity 3 (notice exponent "3")**

***Review*:**

**If zero has even multiplicity (example, 2, 4, 6, etc.), graph touches the *x*-axis but turns around**

**If zero has odd multiplicity (example, 1, 3, 5, etc.), graph crosses the *x*-axis.**

3. Determine if is a factor of *f* .

**is a factor of if and only if .**

**is equivalent to , therefore, .**

**If is a factor of the given polynomial function, then .**

**Thus, is a factor of .**

**Notice that, if we construct the graph of the given function we can see that the graph**

**has a zero (*x*-intercept) at .**

****

4. Use your calculator to find all the real zeros of the function3.

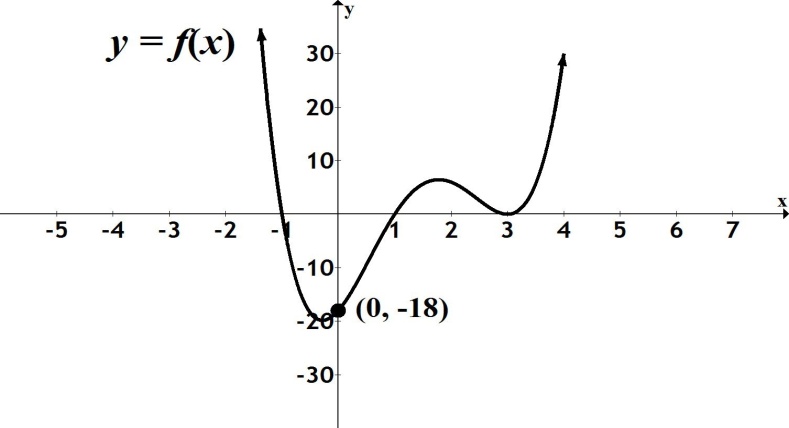
Approximate your answers to 4 decimal places.



[-6, 6, 1] by [-10,10,1] Windows may vary

**Zeros are:** -

5. Find a polynomial that could be represented by the given graph.



**We notice the following characteristics:**

**✓ Both ends of the graph are pointing up, which means that this is an even-degree polynomial**

**with a positive leading coefficient.**

**✓ The graph touches the *x*-axis and turns around at ; this is a zero of even multiplicity. The**

**zeros with odd multiplicity are 1 and 1 because the graph crosses the *x*-axis at these values.**

**So, the real zeros are given at and .**

✓**The *y*-intercept is , therefore  *=* .**

**Solving for , we have:**

**Therefore:  *=***

6. Given

a. Determine the domain. Write your answer using interval notation.

**Division by zero is undefined, therefore, . This means .**

**The domain is given by:**

b. Find the vertical asymptote(s), if any.

**Solving , we have . A vertical asymptote occurs at .**

c. Find the horizontal asymptote, if it exists.

**Degree of numerator = degree of denominator. The horizontal asymptote equals the ratio**

**of the leading coefficients: . A horizontal asymptote occurs at**

7. Given

a. Find the vertical asymptote(s), if any.

**Solving , we have**

**Vertical asymptotes occur at and .**

b. Find the horizontal asymptote, if it exists.

**Degree of numerator less than degree of denominator. The line is the horizontal**

**asymptote.**

c. Find the *x*-intercept.

**We only need to set the numerator and solve for *x*: . Therefore, .**

**The graph of the function will have an *x*-intercept at**

**Optional: Confirm with graph.**

8. Abdul has a business designing and selling sports memorabilia. The average cost per unit (in dollars)

for producing *x* number of items is given by the function  *=* .

a. Find and interpret (150). Round to the nearest dollar and answer in a complete sentence.

**(150) = 4.9167 .**

**The average cost per unit for producing 150 items is approximately $5.**

b. If the average cost per unit is $3.05, how many items can Abdul produce? Round your answer to

the nearest whole number.

**Solving = 3.05, we have**

**items**

c. What is the domain in terms of this problem? Answer in a complete sentence.

**The domain of this function is . Since represents the number of items produced,**

**negative values would not make sense; in addition, there can be no average cost per unit if**

**Abdul were to produce 0 items.**