Bellwork Alg 2 Thursday, November 14, 2019

1. Write a possible equation for a polynomial with the given degree and given number of zeros.

a) 8th degree and 4 distinct real zeros.

b) 9th degree and 6 distinct real zeros.

2. State the degree (actual NUMBER) and leading coefficient (actual NUMBER) for this polynomial:

$y = -2x^4(5x-1)^2(6x-1)(3-2x)^3(4x+3)^2(7-x)^2$

3. Find all x-intercepts by a method other than graphing.

a) $y = -8x^2(x^2+16)(2x-1)(x+4)$

b) $f(x) = 5x^3 - 20x$

c) $y = 500 - 4x^3$

4. Use the given intervals below:

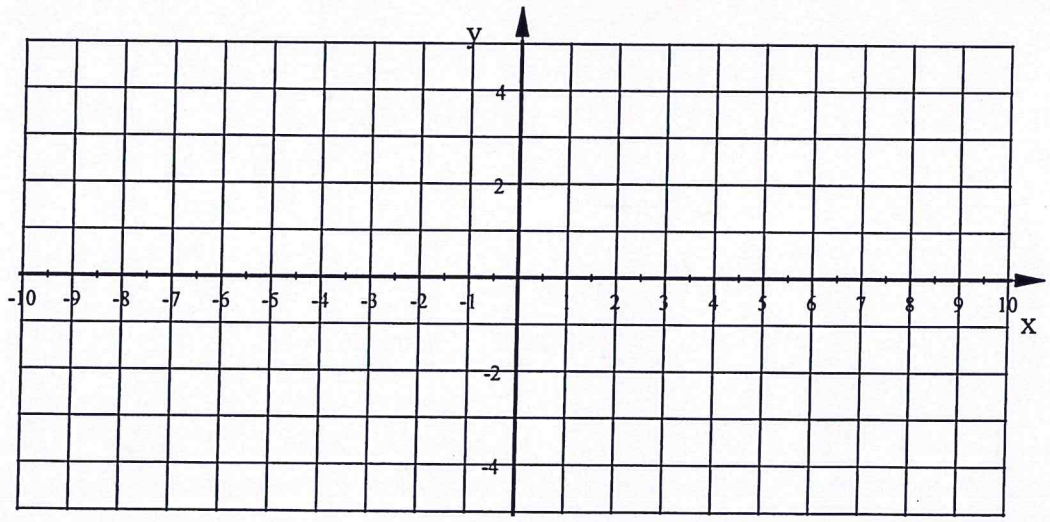
>Increasing and concave up: $(-8,-5) \cup (1,4)$

>Increasing and concave down: $(-5,-3) \cup (4,7)$

>Decreasing and concave up: $(-\infty,-8) \cup (-1,1)$

>Decreasing and concave down: $(-3,-1) \cup (7,\infty)$

a) Sketch a graph with these characteristics. Place a visible dot at each max, min, and pt of inflection.



b) State the x-coordinates of all maximums.

c) State the x-coordinates of all minimums.

d) state the x-coordinates of all points of inflection.

e) What is the most likely degree of this polynomial and is the leading coefficient Positive or Negative?

ANSWERS

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1. Write a possible equation for a polynomial with the given degree and given number of zeros.

a) 8th degree and 4 distinct real zeros. SHOWN ARE SOME EXAMPLE ANSWERS. THERE ARE AN INFINITE # OF POSSIBILITIES

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

b) 9th degree and 6 distinct real zeros.

$y = x^2(x+1)^2(x-2)^2(x+3)(x-4)(x+5)$ or $y = x^2(x+1)(x-2)(x+3)(x-4)(x+5)(x^2+1)$

2. State the degree (actual NUMBER) and leading coefficient (actual NUMBER) for this polynomial:

$y = -2x^4(5x-1)^2(6x-1)(3-2x)^3(4x+3)^2(7-x)^2$

$(-2x^4)(5x)^2(6x)(-2x)^3(4x)^2(-x)^2 = (-2x^4)(25x^2)(6x)(-8x^3)(16x^4)(x^2) = 38{,}400\,x^{14}$

L.C. = 38,400
DEG = 14

3. Find all x-intercepts by a method other than graphing.

a) $y = -8x^2(x^2+16)(2x-1)(x+4)$

x-INT = 0, 1/2, -4 Real zeros of factors shown

b) $f(x) = 5x^3 - 20x$

$0 = 5x^3 - 20x \rightarrow 0 = 5x(x^2-4) \rightarrow 0 = 5x(x+2)(x-2)$

x-INT = 0, ±2

c) $y = 500 - 4x^3$

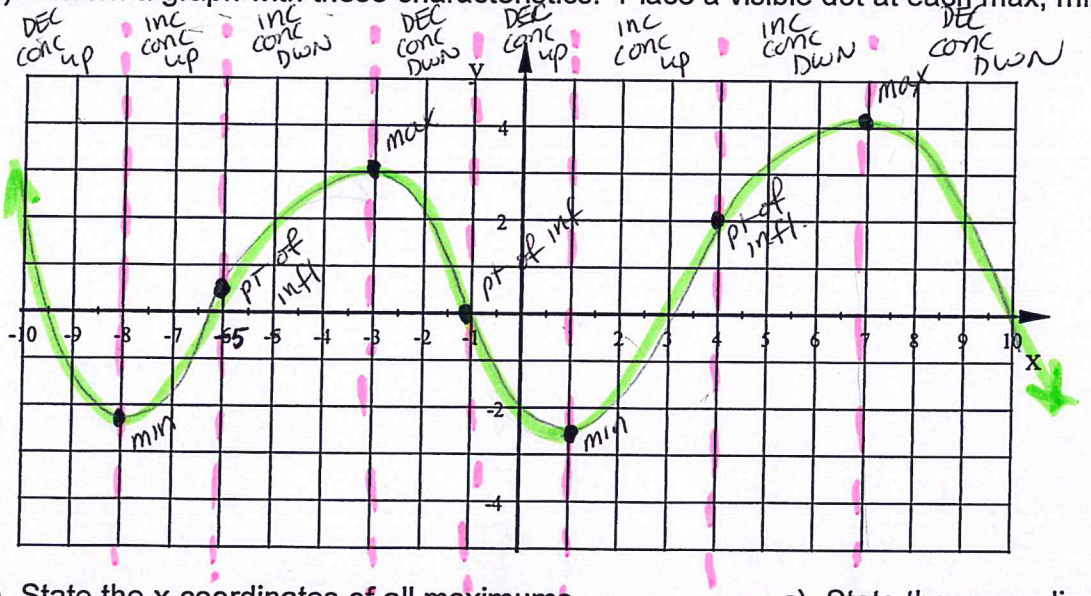
$0 = 500 - 4x^3$
$-500 \quad -500$
$\frac{-500}{-4} = \frac{-4x^3}{-4}$
$\sqrt[3]{125} = \sqrt[3]{x^3}$

x = 5

4. Use the given intervals below:

>Increasing and concave up: $(-8,-5) \cup (1,4)$
>Increasing and concave down: $(-5,-3) \cup (4,7)$
>Decreasing and concave up: $(-\infty,-8) \cup (-1,1)$
>Decreasing and concave down: $(-3,-1) \cup (7,\infty)$

a) Sketch a graph with these characteristics. Place a visible dot at each max, min, and pt of inflection.



b) State the x-coordinates of all maximums.

x = -3, 7

c) State the x-coordinates of all minimums.

x = -8, 1

d) state the x-coordinates of all points of inflection.

x = -5, -1, 4

e) What is the most likely degree of this polynomial and is the leading coefficient Positive or Negative?

5TH DEGREE WITH NEG LEADING COEFF.

↑ 4 extremes & 5 x-int
n-1=4 n=5
n=5

↳ end behavior ↑ ↓