21 + 2

MHF 4U **Quiz 1.1-1.4**

Name: Solutions

Date: September 11, 2012

1. How can you distinguish between a polynomial and a non-polynomial function?

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Polynomial
Domain → x∈R
Range is not bounded upper & lower
coeffs → R#
Exponents → W#

non polynomial
→ asymptote
→ end point
→ fractional exponent
→ multiple variables

2. Complete the following table

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Polynomial	Degree	Max # of zeros	Leading Coefficient	Min # of turning points	End behaviour $x \to \infty$	End Behaviour $x \to -\infty$
$y=-6x^5-4x^3+2x+1$	5	5	-6	0	$y \to -\infty$	$y \to \infty$
$y=7x-4x^2+3x^3+5$	3	3	3	0	$y \to \infty$	$y \to -\infty$
$y=3x^2(3-x)$	3	3	-3	0	$y \to -\infty$	$y \to \infty$
$y=(x-1)^2(x+4)^2$	4	4	1	1	$y \to \infty$	$y \to \infty$

3. Sketch the graph of a polynomial function that has the following:

a) Degree of 4 with 2 zeros and a negative leading coefficient

b) Positive leading coefficient, quintic with zeros of 2, -3(order of 2) , 1(order 2)

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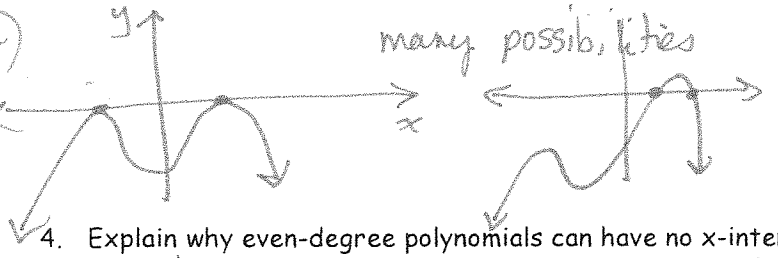
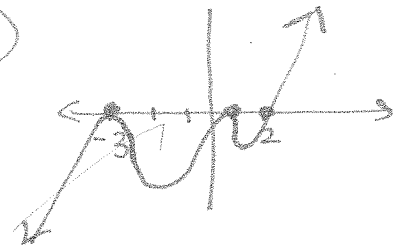
a)



many possibilities

b)



4. Explain why even-degree polynomials can have no x-intercepts.

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since both end behaviours go in the same direction they could avoid the x-axis if 1) k > 0 and the min are above x-a
2) k < 0 and the maxs are below x-

5. State intervals of increase for the following functions in interval notation

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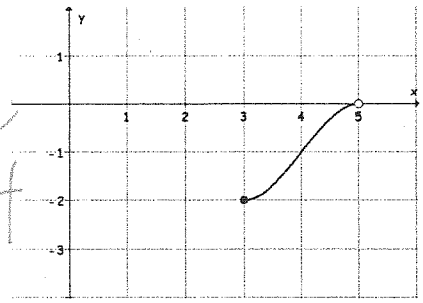
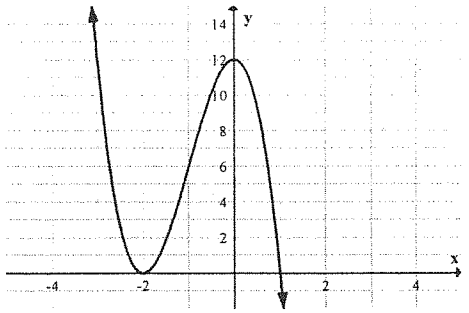
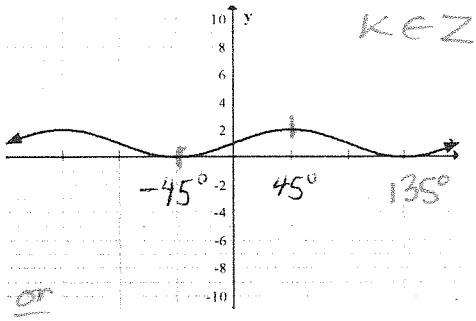
[3,5)



(-2,0)



$(135° + 180°k, 225° + 180°k)$ $k \in Z$



or

$(-45° + 180°k, 45° + 180°k)$ $k \in Z$

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6. Given the table of values of a polynomial, determine the equation.

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x	y
-2	27
-1	1
0	-1
1	-3
2	-29
3	-103

1st: -26, -2, -2, -26, -24
2nd: 24, -24, 0, -24, -48
3rd: -24, 24

∵ common third diff

∴ $y = ax^3 + bx^2 + cx + d$

① (0,-1) ∴ d = -1

② $6a = -24$
$a = -4$

③ $6a + 2b = -24$
$6(-4) + 2b = -24$
$b = 0$

④ $a + b + c = -2$
$-4 + 0 + c = -2$
$c = 2$

∴ $y = -4x^3 + 2x - 1$