

91%

period 1

MHF-4U

QUIZ #1 (Knowledge & Understanding)

31
34

1. For each of the following functions complete the table.

$y = -3x^4 + 4x^3 + 6x - 1$

$y = x^5 - 4x^4 + 3x^3 - x + 7$

(12)

- a) minimum # of zeros
- b) maximum # of zeros
- c) minimum # of turning points
- d) maximum # of turning points
- e) end behaviours i) as $x \rightarrow \infty$
ii) as $x \rightarrow -\infty$

0 ✓
4 (same as exponent) ✓
1 ✓
3 (n-1) ✓
 $y \rightarrow -\infty$ ✓
 $y \rightarrow -\infty$ ✓

1 ✓
5 ✓
0 ✓
4 ✓
 $y \rightarrow \infty$ ✓
 $y \rightarrow -\infty$ ✓

12 ✓

2. Sketch a possible graph for each situation involving polynomial functions.

- a) degree 3, negative leading coefficient, 2 zeros, 2 turning points
- b) degree 4, positive leading coefficient, 2 zeros, 3 turning points
- c) degree 5, negative leading coefficient, 3 zeros, 4 turning points

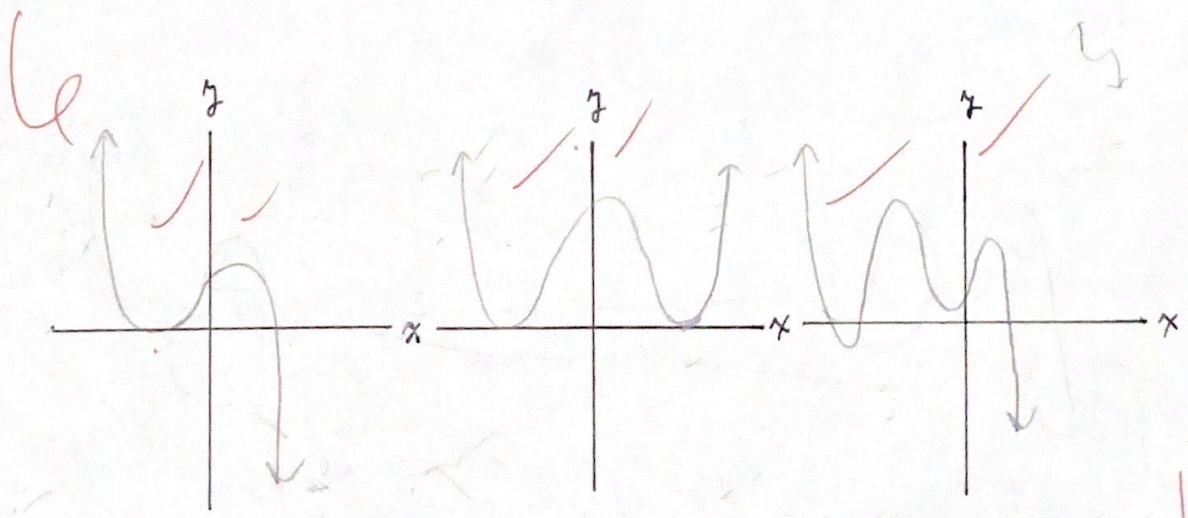
even
ex: 4 same direction
odd
ex: 3 opposite

a)

b)

c)

(2)
(2)
(2)



18
18

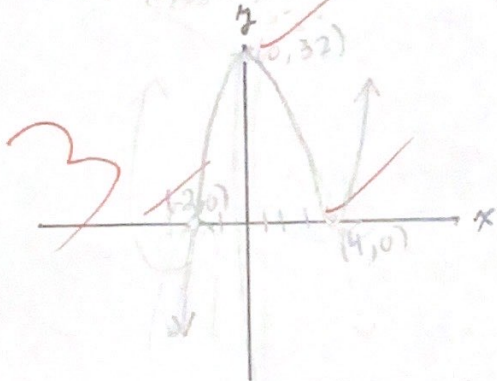
$$(x-4)(x-4)(x+2)$$

$$(x^2+16-8x)(x+2)$$

3. Sketch a possible graph of each function and label major points. (x and y intercepts)

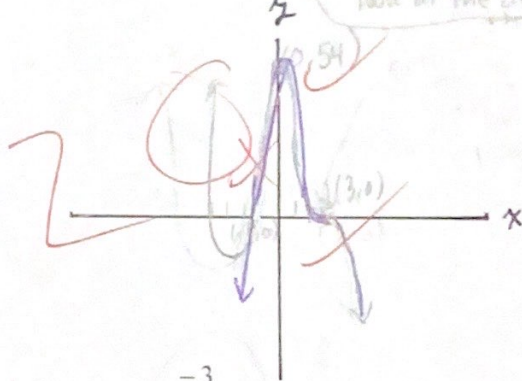
3

a) $f(x) = (x-4)^2(x+2)$



3

b) $g(x) = -2(x-3)^3(x+1)$



4. Write the equation of the quartic function that has zeros $1, \frac{-3}{2}, -2$ and -1 , and a y-intercept of 18. Show work.

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$$18 = a(0-1)(2(0)+3)(0+2)(0+1)$$

$$3 = a$$

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

$$(0, 18)$$

$$x = -\frac{3}{2}$$

$$2x+3=0$$

5. a) Describe the transformations, in words, that were applied to $y = x^4$ to create the following function. $y = 162\left(\frac{-1}{3}\right)^4(x-2)^4 - 5$

5

$$y = a(x-k)^n + c$$

Vertical stretch by a factor of 162

horizontal stretch by a factor of 3

~~horizontal~~ reflection in y-axis

horizontal shift right 2 units

vertical shift down 5 units

b) Combined the "a" and "k" values to produce a simplified version of the function.

$$y = 162y - 5$$

$$x = -3x + 2$$

$$y = 162\left(\frac{-1}{3}\right)^4(x-2)^4 - 5$$

$$y = 162\left(\frac{1}{81}\right)(x-2)^4 - 5$$

$$y = 2(x-2)^4 - 5$$

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