

Name: _____ Hour: _____ Date: _____

Polynomials Unit Test Review Guide

Test Date: Wednesday, March 6, 2018

DO ALL WORK ON A SEPARATE SHEET OF PAPER

Complete the following tables. Remember, you need to have this information memorized for Wednesday!

Classifying by Degree (the "first name" of the polynomial)		
Degree	Name	Example
0	CONSTANT	-16
1	LINEAR	$3x + 2$
2	QUADRATIC	$x^2 - x - 7$
3	CUBIC	$-5x^3 + 7$
4	QUARTIC	$x^4 - 16x^2 + 8$
5	QUINTIC	$-x^5 + 18x^3 - 10$

Classifying by Number of Terms (the "last name" of the polynomial)		
# of Terms	Name	Example
1	MONOMIAL	$18x$
2	BINOMIAL	$8x^3 - 27$
3	TRINOMIAL	$x^5 + x^4 + x$
4 or more	POLYNOMIAL	$3x^3 - 9x^2 + 10x + 7$

Find the product of the following polynomials. Write the product in standard form, classify the polynomial by degree/number of terms and describe the end behavior.

1) $(x - 3)^2(x - 1)$

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

3) $(-2x^3 + 3x - 1)(x^2 + 5)$

4) $x^2(x^4 - 16)$

Factor the following polynomials. HINT – Sometimes you only need to factor out a GCF and sometimes you need to factor completely.

5) $18a^2b^2 - 36a^4b^3 + 27a^7b^4$

6) $3x^2y - 9xy^4$

7) $-2x^2y + 4x^4y + 6x^6y$

8) $3x^4 - 18x^3 + 24x^2$

9) $x^3 - 9x$

10) $-4w^5 + 20w^4 - 24w^3$

11) $12x^6 - 8x^5 - 40x^4$

12) $-6x^3 - 9x^2 + 27$

13) $10x^4 + 38x^3 + 24x^2$

Determine the zeros of each polynomial. If there are any multiples list them with their multiplicity. Sketch a graph of the function.

14) $y = -(2x + 6)(x - 2)(x + 6)(x - 4)$

15) $y = -x(x - 2)(x + 5)$

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

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

18) $y = x^4 - 8x^3 + 16x^2$

19) $y = x^3 - 6x^2 - 16x$

20) $y = -2x^6 - 20x^5 - 48x^4$

21) $y = -2x^7 - 4x^6 + 70x^5$

① $(x-3)(x-3)(x-1)$

$(x^2-6x+9)(x-1)$

x^3-6x^2+9x

$+ -x^2+6x-9$

a) $x^3-7x^2+15x-9$

b) cubic c) polynomial

d) x^3 a+, nodd $\swarrow \uparrow$

② $-x^2(x+2)^2$

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

a) $-x^4-4x^3-4x^2$

b) quartic c) trinomial

d) $-x^4$ a-, neven $\swarrow \downarrow$

③ $(-2x^3+3x-1)(x^2+5)$

a) $-2x^5+3x^3-x^2$

$-10x^3+15x-5$

a) $-2x^5-7x^3-x^2+15x-5$

b) quintic c) polynomial of 5 terms d) x^6 a+, neven $\uparrow \uparrow$

d) a-, nodd $\uparrow \downarrow$

④ $x^2(x^4-16)$

a) x^6-16x^2

b) 6th degree polynomial

c) binomial

d) x^6 a+, neven $\uparrow \uparrow$

⑤ $9a^2b^2(2-4a^2b+3a^5b^2)$

⑥ $3xy(x-3y^3)$

⑦ $-2x^2y(1-2x^2-3x^4)$

⑧ $3x^2(x^2-6x+8)=3x^2(x-2)(x-4)$

⑨ $x(x^2-9)=x(x-3)(x+3)$

⑩ $-4w^3(w^2-5w+6)=-4w^3(w-2)(w-3)$

⑪ $4x^4(3x^2-2x-10)$

⑫ $-3(2x^3+3x^2-9)$

⑬ $2x^2(5x^2+19x+12)$
 $2x(5x+4)(x+3)$

⑭ a) $x=-3, x=2, x=-6, x=4$

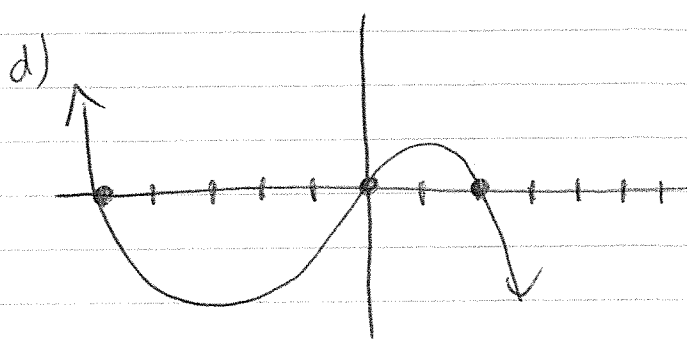
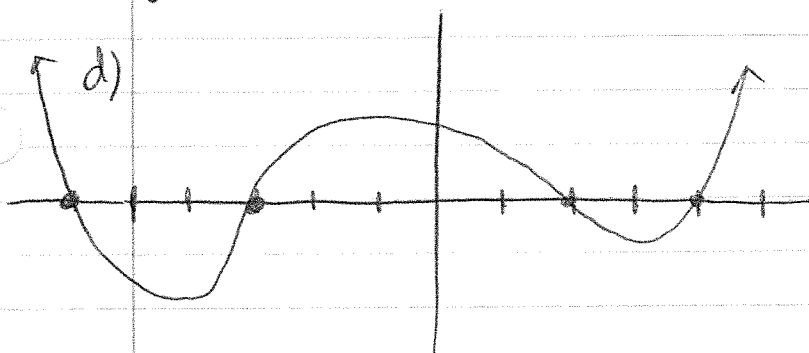
b) —

c) $y=-2x^4$ a-, neven $\swarrow \downarrow$

⑮ a) $x=0, x=2, x=5$

b) —

c) $y=-x^3$, a-, nodd $\uparrow \downarrow$



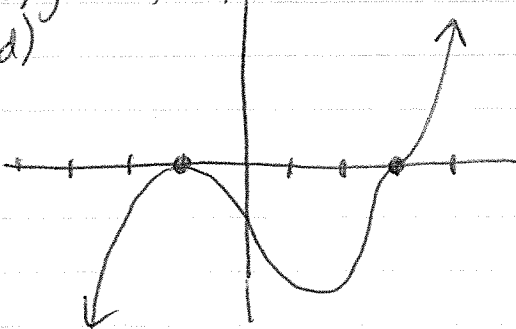
16) a) $x=3, x=-1$

b) 3, multiplicity 2

-1, multiplicity 3

c) $y=1x^5$, a+, nodd ↖ ↗

d)



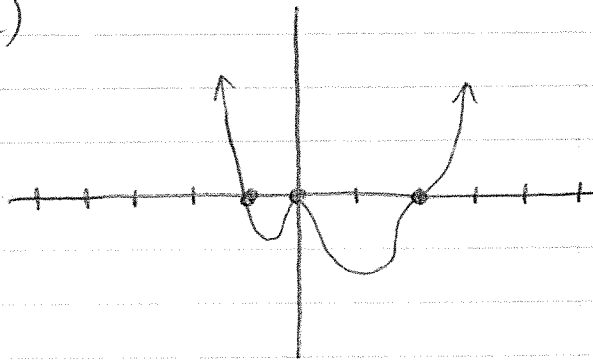
17) a) $x=0, x=-1, x=2$

b) 0, multiplicity 2

2, multiplicity 3

c) $y=1x^6$ a+, n even ↖ ↗

d)



18) $y=x^2(x^2-8x+16)$

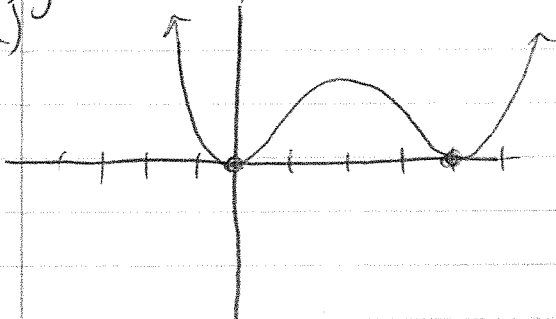
$y=x^2(x-4)^2$

a) $x=0, x=4$

b) 0, multiplicity 2 4, multiplicity 2

c) $y=1x^4$ a+, n even ↖ ↗

d)



19) $y=x(x^2-6x-16)$

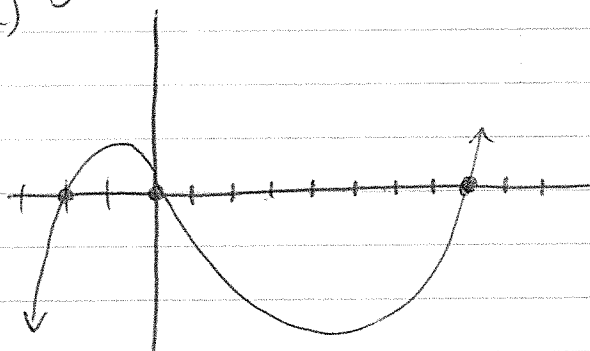
$y=x(x-8)(x+2)$

a) $x=0, x=8, x=-2$

b) -

c) $y=1x^3$, a+, n odd ↖ ↗

d)



20) $y=-2x^4(x^2+10x+24)$

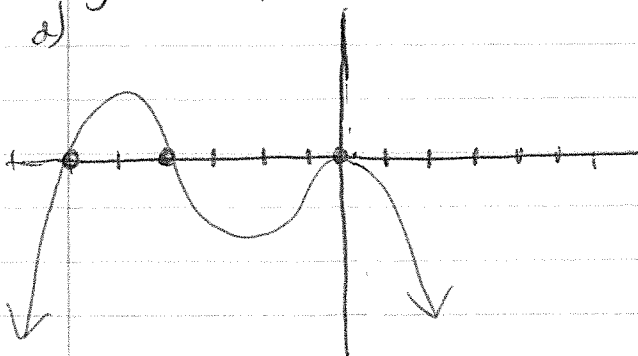
$y=-2x^4(x+6)(x+4)$

a) $x=0, x=-6, x=-4$

b) 0, multiplicity 4

c) $y=-2x^6$, a-, n even ↖ ↗

d)



21) $y=-2x^5(x^2+2x-35)$

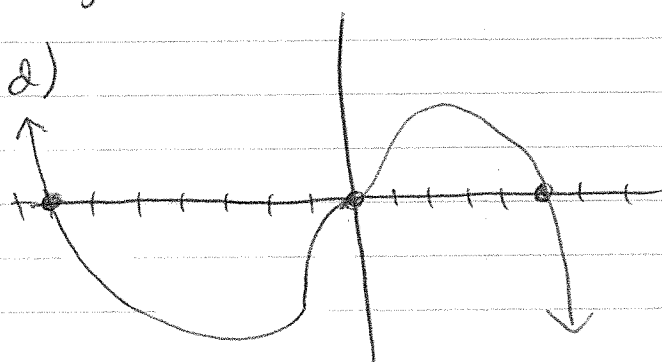
$y=-2x^5(x+7)(x-5)$

a) $x=0, x=-7, x=5$

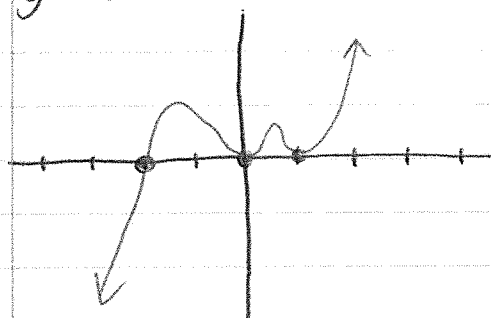
b) 0, multiplicity 5

c) $y=-2x^7$, a-, n odd ↖ ↗

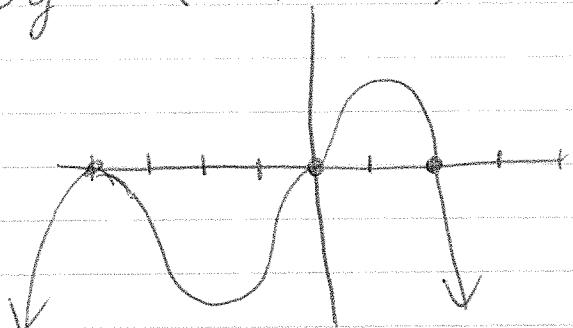
d)



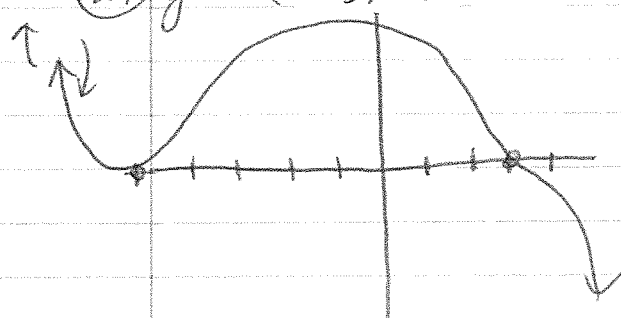
②② $y = x^2(x-1)^4(x+2)$



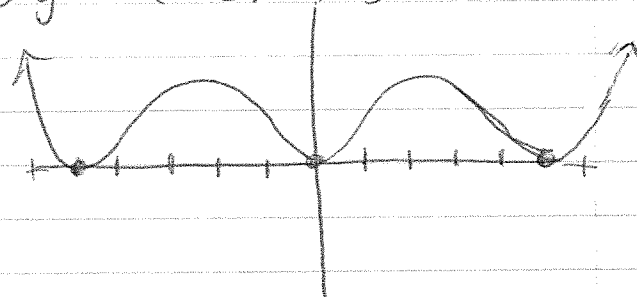
②③ $y = -x^3(x+4)^2(x-2)$ ↓ ↓



②④ $y = -(x-3)^3(x+5)^2$



②⑤ $y = x^4(x+5)^2(x-5)^2$ ↑ ↑



②⑥ $y = x^2(x-3)^2$

②⑦ $y = x^2(x+2)^2(x-1)$

②⑧ $y = -(x+3)(x+2)(x-1)$

②⑨ $y = -(x+3)(x+1)(x-1)^2$

③⑩ $f(x)$ 2ND
 $g(x)$ 1ST

$h(x)$ 4TH
 $j(x)$ 3RD