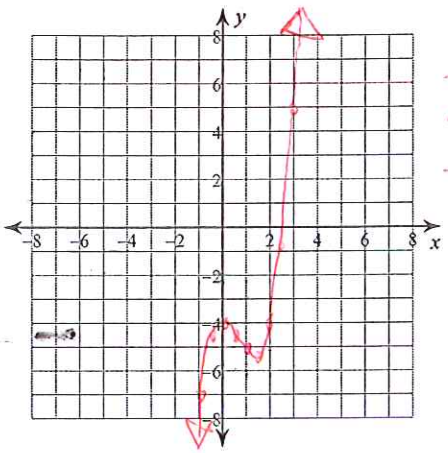
Algebra 2 Name Key ID: 1

Review for Quarter 3 Quarterly Exam

Date_____ Period____

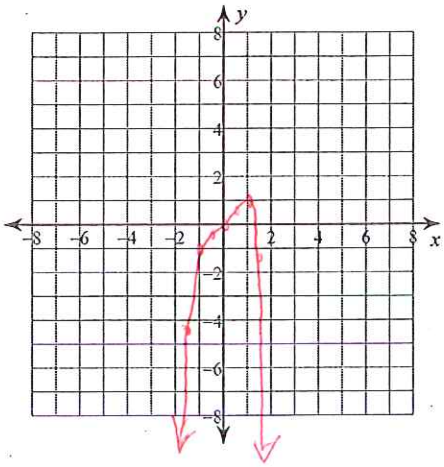
Sketch the graph of each function. Type into calculator. Make table go up by 1/2's

1) $f(x) = x^3 - 2x^2 - 4$



x	y
-1.5	-11.9
-1	-7
-0.5	-4.6
0	-4
0.5	-4.4
1	-5
1.5	-5.1
2	-4
2.5	-.9
3	5
3.5	14.4

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



x	y
-2	-14
-1.5	-4.3
-1	-1
-0.5	-.3
0	0
0.5	.7
1	1
1.5	-1.3
2	-10

State the maximum number of turns the graph of each function could make. One less than the degree

3) $f(x) = x^3 - 4x^2 + 5$

2

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

3

Describe the end behavior of each function.

5) $f(x) = x^3 - x^2 - 3$

ODD-opposite
positive a-value

falls to left
rises to right or $f(x) \to -\infty$ as $x \to -\infty$
$f(x) \to \infty$ as $x \to \infty$

6) $f(x) = -x^4 + 2x^2 - x + 3$

↳ even → same direction
↳ negative → both down

falls to left
falls to right or $f(x) \to -\infty$ as $x \to \pm\infty$
$f(x) \to \infty$ as $x \to \infty$

Name each polynomial by degree and number of terms.

7) 7 constant monomial

8) $-n^5 - 3$

quintic binomial

9) $2b^3 - 3$ cubic trinomial

10) $7v^2 - 7v - 3$

quadratic trinomial

Evaluate each function at the given value using synthetic substitution.

11) $f(x) = x^3 - 8x^2 + 15x - 3$ at $x = 2$

2	1	-8	15	-3
	↓	2	-12	6
	1	-6	3	3

$f(2) = 3$

12) $f(m) = m^4 + 8m^3 + 16m^2 - 3m - 8$ at $m = -3$

-3	1	8	16	-3	-8
	↓	-3	-15	-3	18
	1	5	1	-6	10

$f(-3) = 10$

Find all zeros by factoring each completely.

13) $(21p^3 + 49p^2) + (24p + 56)$

$7p^2(3p+7) + 8(3p+7)$

$(7p^2+8)(3p+7) \rightarrow p = -7/3$

$7p^2+8=0$

$\sqrt{p^2} = \sqrt{\frac{-8}{7}}\,\frac{\sqrt{7}}{\sqrt{7}}$

$p = \pm\frac{i\sqrt{56}}{7}$ $\frac{\sqrt{14}\,2}{\sqrt{14}}$

$\boxed{p = \pm\frac{2i\sqrt{14}}{7},\ -7/3}$

14) $4x^4 - 36x^2 + 80$

Add Mult

$4(x^4 - 9x^2 + 20)$

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

$4(x+2)(x-2)(x^2-5)$

$\boxed{x = 2, -2, \pm\sqrt{5}}$

Expand completely.

15) $(2x+1)^3$

1 3 3 1

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

1 1^2

$\boxed{8x^3 + 12x^2 + 6x + 1}$

Find all zeros.

16) $f(x) = 3x^4 - 10x^2 + 7$

$(3x^4 - 3x^2 - 7x^2 + 7)$

$3x^2(x^2-1) - 7(x^2-1)$

$(3x^2-7)(x^2-1) = 0$

$x^2 = 7/3$ $x = \pm\frac{\sqrt{7}}{\sqrt{3}}\frac{\sqrt{3}}{\sqrt{3}}$ $\rightarrow (x+1)(x-1)$

$\boxed{x = \pm\frac{\sqrt{21}}{3},\ \pm 1}$

17) $f(x) = 3x^4 + 5x^2 - 12$

add

-36 mult

$3x^4 + 9x^2 - 4x^2 - 12$

$3x^2(x^2+3) - 4(x^2+3)$

$(3x^2-4)(x^2+3) = 0$

$\sqrt{x^2} = \sqrt{\frac{4}{3}}\frac{\sqrt{3}}{\sqrt{3}}$

$x = \frac{\pm 2\sqrt{3}}{3}$

$\boxed{x = \pm i\sqrt{3},\ \pm\frac{2\sqrt{3}}{3}}$

Simplify.

18) $\frac{\sqrt[3]{10}}{4\sqrt[3]{27}}$ 3

$\frac{\sqrt[3]{10}}{12}$

19) $\frac{\sqrt[5]{5}}{3\sqrt[5]{1024}}$ 4

$\cancel{5\sqrt{5}}$ $\frac{\sqrt[5]{5}}{12}$

Simplify. Your answer should contain only positive exponents.

20) $\frac{2a^4 \cdot (a^3)^4}{2a^2} = a^2 \cdot a^{12} = \boxed{a^{14}}$

21) $2u^{-4}v^{-1} \cdot u^{-3}v^{-2}$

$\frac{2}{u^4 v u^3 v^2} = \boxed{\frac{2}{u^7 v^3}}$

Simplify.

22) $\frac{\sqrt[3]{-5}}{\sqrt[3]{4}}\,\frac{\sqrt[3]{2}}{\sqrt[3]{2}} = \frac{\sqrt[3]{-10}}{\sqrt[3]{8}} = \boxed{\frac{\sqrt[3]{-10}}{2}}$

23) $\sqrt[3]{-36x^4} \cdot \sqrt[3]{9x^4}$

$\sqrt[3]{-324x^8}$

$\sqrt[3]{27 \cdot 12x^8}$

3

$\boxed{3x^2\sqrt[3]{12x^2}}$

24) $\frac{\sqrt{2}}{\sqrt{3}}\,\frac{\sqrt{3}}{\sqrt{3}} = \boxed{\frac{\sqrt{6}}{3}}$