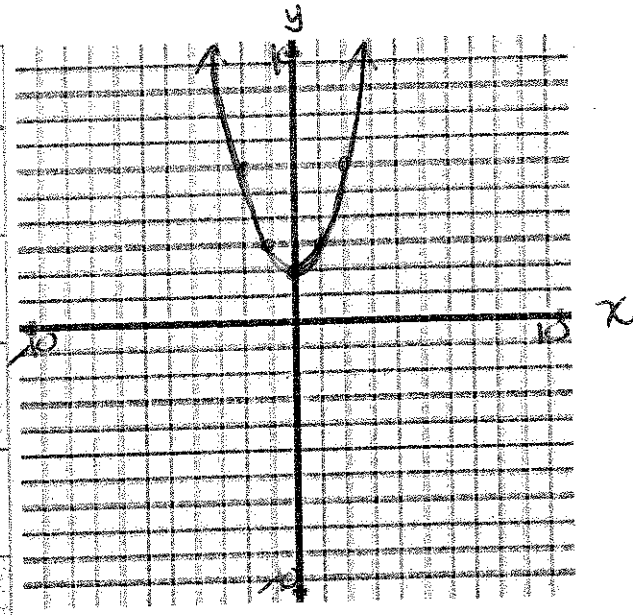
EXAM 3/CHAPTERS 5-6
86 POINTS POSSIBLE

NAME Key

LEAVE ALL ANSWERS EXACT (NO DECIMALS!) UNLESS THE PROBLEM INDICATES OTHERWISE
SHOW ALL WORK IN ORDER TO EARN FULL CREDIT

1. (5 POINTS) Graph the equation ~~$y=x^2+2$~~ by plotting 5 points. **LABEL AXES AND WRITE IN THE SCALE!**

x	$y=x^2+2$	(x,y)
-2	$y=(-2)^2+2=6$	$(-2,6)$
-1	$y=(-1)^2+2=3$	$(-1,3)$
0	$y=(0)^2+2=2$	$(0,2)$
1	$y=(1)^2+2=3$	$(1,3)$
2	$y=(2)^2+2=6$	$(2,6)$



2. (3 POINTS) Subtract, as indicated.

$$\left(-4x^2-5x+8x^2y-13xy^2+9y^2\right)-\left(2x-8xy^2-y+7y^2\right)$$

$$=-4x^2-5x+8x^2y-13xy^2+9y^2-2x+8xy^2+y-7y^2$$

$$=\boxed{-4x^2-7x+8x^2y-5xy^2+2y^2+y}$$

3. (2 POINTS) Determine the degree of the polynomial.

$3x^4+56x^2-x$

Degree: 4

4. (10 POINTS) Multiply and simplify.

a. (2 POINTS)

$(-3x^2y^{-1})(15xy^5) = \boxed{-45x^3y^4}$

b. (4 POINTS)

$(2x+7)^2 = (2x+7)(2x+7)$

$= 4x^2+14x+14x+49$

$= \boxed{4x^2+28x+49}$

c. (4 POINTS)

$(x+2)(12x^2-20x-11) = 12x^3-20x^2-11x+24x^2-40x-22$

$= \boxed{12x^3+4x^2-51x-22}$

5. (8 POINTS) Divide.

a. (3 POINTS)

$\dfrac{54x^4y^3+36x^3y^2-27x^2y}{9xy} = \dfrac{54x^4y^3}{9xy}+\dfrac{36x^3y^2}{9xy}-\dfrac{27x^2y}{9xy}$

$= \boxed{6x^3y^2+4x^2y-3x}$

b. (5 POINTS)

$(-2x^3+x^2-8x+3)\div(x+4)$ = $\boxed{-2x^2+9x-44+\frac{179}{x+4}}$

$$
\begin{array}{r}
-2x^2+9x-44 \\
(x+4)\overline{)-2x^3+x^2-8x+3} \\
-(-2x^3-8x^2) \\
\hline
9x^2-8x \\
-(9x^2+36x) \\
\hline
-44x+3 \\
-(-44x-176) \\
\hline
179
\end{array}
$$

6. (18 POINTS, 6 POINTS EACH) Factor. **I will only award partial credit if work is shown.**

a. $81z^2-100 = (9z)^2-(10)^2$

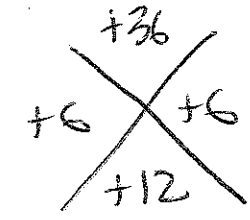
$= \boxed{(9z+10)(9z-10)}$

b. $2x^3+5x^2-8x-20 = x^2(2x+5)-4(2x+5)$

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

$= \boxed{(2x+5)(x+2)(x-2)}$

c. $2x^2+24x+72 = 2(x^2+12x+36)$



$= 2[x^2+6x+6x+36]$

$= 2[x(x+6)+6(x+6)]$

$= \boxed{2(x+6)(x+6) \text{ or } 2(x+6)^2}$

7. (20 POINTS, 10 POINTS EACH) Factor by grouping. **No credit will be given for trial and error.**

a. $3x^2+5x-12$

-36
-4 +9
+5

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

$=x(3x-4)+3(3x-4)$

$=\boxed{(3x-4)(x+3)}$

b. $6x^2+19xy+8y^2$

48
+16 +3
19

$=6x^2+16xy+3xy+8y^2$

$=2x(3x+8y)+y(3x+8y)$

$=\boxed{(3x+8y)(2x+y)}$

8. (20 POINTS, 10 POINTS EACH) Solve. Your result(s) should be given in roster notation.

a. $(x-8)(2x+5)=0$

$x-8=0$ or $2x+5=0$

$x=8$ $\quad 2x=-5$

$x=-\frac{5}{2}$

$\boxed{\left\{-\frac{5}{2},8\right\}}$

b. $3x^2-11x=-10$

30
-6 -5
-11

~~$3x^2-11x=-10$~~

$3x^2-11x+10=0$

$3x^2-6x-5x+10=0$

$3x(x-2)-5(x-2)=0$

$(x-2)(3x-5)=0$

$x-2=0$ or $3x-5=0$

$x=2$ $\quad 3x=5$

$x=\frac{5}{3}$

$\left\{\frac{5}{3},2\right\}$