Algebra 2 Fall Final Review Part II Name _____

1 – 4 Use the matrix A below to find:

$$A=\begin{bmatrix}4 & 1 & 9\\ -5 & 3 & -2\\ 7 & -4 & -1\end{bmatrix}$$

1) A_{12} (row, column) = 1

2) A_{32} = −4

3) A_{22} = 3

4) Which is greater: A_{23} or A_{32}? A_{23}

5 – 6 Find the sum or difference if possible.

5) $\begin{bmatrix}4 & 7\\ -2 & 1\end{bmatrix}-\begin{bmatrix}-9 & 3\\ 6 & 0\end{bmatrix}=\begin{bmatrix}13 & 4\\ -8 & 1\end{bmatrix}$

6) $\begin{bmatrix}3 & 1 & -1\\ 2 & 4 & 0\end{bmatrix}+\begin{bmatrix}0 & -2\\ 1 & 4\\ 3 & 5\end{bmatrix}$ not possible (must have same dimensions)

7) If $A=\begin{bmatrix}2 & 6\\ 1 & 0\end{bmatrix}$ and $B=\begin{bmatrix}-1 & 5 & 0\\ 4 & -1 & 3\end{bmatrix}$ what are the dimensions of A * B?

$2\times\cancel{2}\ \ \cancel{2}\times 3 = 2\times 3$

8) Find A*B in #43.

$$\begin{bmatrix}22 & 4 & 18\\ -1 & 5 & 0\end{bmatrix}$$

9 – 10 Find the Determinant

9) $\begin{bmatrix}2 & -1\\ 3 & 4\end{bmatrix}$ $2(4)-3(-1)\Rightarrow 11$

10) $\begin{bmatrix}1 & 3 & -1\\ -1 & 0 & 2\\ 2 & 1 & -2\end{bmatrix}=5$

#11 -12 Find the inverse

11) $\begin{bmatrix}3 & -1\\ 2 & 4\end{bmatrix}^{-1}=\begin{bmatrix}2/7 & 1/14\\ -1/7 & 3/14\end{bmatrix}$

12) $\begin{bmatrix}-1 & 0 & 1\\ 4 & 2 & 1\\ 3 & -1 & 1\end{bmatrix}=\begin{bmatrix}-3/13 & 1/13 & 2/13\\ 1/13 & 4/13 & -5/13\\ 10/13 & 1/13 & 2/13\end{bmatrix}$

13 – 15 Solve using Matrices

13) $2x-y=5$, $x+4y=7$

$\begin{bmatrix}2 & -1\\ 1 & 4\end{bmatrix}\begin{bmatrix}x\\ y\end{bmatrix}=\begin{bmatrix}5\\ 7\end{bmatrix}$ (A, B)

$A^{-1}B=\begin{bmatrix}3\\ 1\end{bmatrix}$

14) $x+y=-6$, $4x=3y+2$, $4x-3y=2$

$\begin{bmatrix}1 & 1\\ 4 & -3\end{bmatrix}\begin{bmatrix}x\\ y\end{bmatrix}=\begin{bmatrix}-6\\ 2\end{bmatrix}$ (A, B)

$A^{-1}B=\begin{bmatrix}-16/7\\ -26/7\end{bmatrix}$

15) $X+\begin{bmatrix}2 & -1\\ 4 & 3\end{bmatrix}=\begin{bmatrix}0 & -1\\ 5 & 6\end{bmatrix}$

$X=\begin{bmatrix}-2 & 0\\ 1 & 3\end{bmatrix}$

16) Solve for x and y

$\begin{bmatrix}x-1 & 3\\ 4 & 3y-1\end{bmatrix}=\begin{bmatrix}3x+2 & 3\\ 4 & 5\end{bmatrix}$

$x-1=3x+2$, $-3=2x$, $x=-3/2$

$3y-1=5$, $3y=6$, $y=2$

17) Which point mazimizes the following objective function: P = 3x + 5y?

$3(0)+5(5)=25$ $3(8)+5(0)=24$

$3(2)+5(3)=21$ $3(1)+5(4)=23$

a. (0, 5) b. (2, 3) c. (8,0) d. (1, 4)

18) Does the following table represent a linear or quadratic regression?

x	1	2	3	4	5
y	−2.2	−2.8	−5.8	−11.2	−19

−.6, −3, −5.4, −7.8

−2.4, −2.4, −2.4

Quadratic

Find the model that best fits this situation:

$y=-1.2x^2+3x-4$

19 – 21 Find the vertex

19) $y=(x-2)^2+3$

$(2, 3)$

20) $y=(x-1)^2$

$(1, 0)$

21) $y=2x^2-12x+8$

$\frac{-b}{2a}=\frac{-(-12)}{2(2)}=\frac{12}{4}=3 \quad x=3$

$2(3)^2-12(3)+8=-10$ $\boxed{(3,-10)}$

#22 – 25 Find the zeros

Factor or Quad Form

22) $x^2-x-20=0$

$(x-5)(x+4)=0$

$x-5=0 \mid x+4=0$

$x=5 \quad x=-4$

$\boxed{x=5,-4}$

Factor or Quadratic Form

23) $2x^2+3x-5=0$ ($a=2, b=3, c=-5$)

$\frac{-3\pm\sqrt{(3)^2-4(2)(-5)}}{2(2)}$

$x=\frac{-3\pm\sqrt{49}}{4}=\frac{-3\pm7}{4}$

$\boxed{x=1,-5/2}$

Factor, Square Root, Quad Form

24) $\frac{49x^2}{49}=\frac{36}{49}$

$\sqrt{x^2}=\sqrt{\frac{36}{49}}$

$x=\pm\frac{6}{7}$

Quadratic Formula

25) $3x^2+2x=-4$

$3x^2+2x+4=0$ (a) (b) (c)

$\frac{-2\pm\sqrt{(2)^2-4(3)(4)}}{2(3)}$

$x=\frac{-2\pm\sqrt{-44}}{6} \Rightarrow x=\frac{-2\pm2i\sqrt{11}}{6}$

$\boxed{x=\frac{-1\pm i\sqrt{11}}{3}}$

26 – 27 Find the Domain and Range

26) $y=-(x-2)^2+3$

D: $\mathbb{R}$ Range: $y\le3$

27) $y=2|x+5|-2$

D: $\mathbb{R}$ Range: $y\ge-2$

Simplify (no negative exponents)

28) $(a^3b^2)(a^4b)$

$(a^3\cdot a^4)(b^2\cdot b^1)$

$\boxed{a^7b^3}$

29) $(4x^3y^7)^2$

$(4x^3y^7)(4x^3y^7)$

$\boxed{16x^6y^{14}}$

30) $(3x^{-2}y^3)^{-2}$

$3^{-2}x^4y^{-6}$

$\boxed{\frac{x^4}{9y^6}}$

31) $\left(\frac{3x^{-3}y^4}{4x^5y^{-2}}\right)^{-2}=\left(\frac{3y^6}{4x^7}\right)^{-2}$

$\frac{3^{-2}y^{-6}}{4^{-2}x^{-14}}=\boxed{\frac{16x^{14}}{9y^{12}}}$

32 – 35 Simplify (no negatives under radicals or radicals in denominator)

32) $\sqrt{24}$

$\sqrt{4}\sqrt{6}$

$\boxed{2\sqrt{6}}$

33) $\sqrt{-12}$

$i\sqrt{12}$

$\sqrt{4}\sqrt{3}$

$\boxed{2i\sqrt{3}}$

34) $\sqrt{18}\cdot\sqrt{12}$

$\sqrt{216}$

$\sqrt{36}\sqrt{6}$

$\boxed{6\sqrt{6}}$

35) $\frac{4}{\sqrt{5}}\cdot\frac{\sqrt{5}}{\sqrt{5}}$

$\boxed{\frac{4\sqrt{5}}{5}}$

#36 – 41 Simplify (no i's in the denominator)

36) i^{42}

$i^2=\boxed{-1}$

37) i^{33}

$i^1=\boxed{i}$

38) $(4+3i)(1-2i)$

$4-8i+3i-6i^2$

$4-5i-(-6)$

$\boxed{10-5i}$

39) $(2+3i)^2$

$(2+3i)(2+3i)$

$4+6i+6i+9i^2$

$4+12i+9(-1)$

$\boxed{-5+12i}$

40) $\frac{6}{i}\cdot\frac{i}{i}$ $\frac{6i}{i^2}=\frac{6i}{-1}$

$\boxed{-6i}$

41) $\frac{4}{1-2i}\left(\frac{1+2i}{1+2i}\right)$

$\frac{4+8i}{1-2i+2i-4i^2}=\boxed{\frac{4+8i}{5}}$

$1-4(-1)$