KEY

Academic Algebra 2
Pretest Matrices

1. Find the product of $\begin{bmatrix} -2 & -8 \\ -4 & 0 \\ 20 & 9 \end{bmatrix}\begin{bmatrix} 0 & 4 \\ -5 & 2 \end{bmatrix}$ =

$3\times 2 \quad 2\times 2$

3×2

$\begin{bmatrix} (-2)(0)+(-8)(-5) & (-2)(4)+(-8)(2) \\ 40 & -8+-16 \\ & -24 \\ (-4)(0)+(0)(-5) & (-4)(4)+(0)(2) \\ 0 & -16 \\ (20)(0)+(9)(-5) & (20)(4)+(9)(2) \\ -45 & 98 \end{bmatrix}$

2. Find the dimensions of the product of matrices

A. 2 x 4 with a 4 x 7 = 2×7

B. 5 x 3 with a 5 x 3 = $\emptyset$

C. 6 x 2 with a 2 x 1 = 6×1

D. 2 x 1 with a 1 x 2 = 2×2

3. Find n in the matrix equation, $4\begin{bmatrix} -3 & 4 \\ n & 12 \end{bmatrix}+\begin{bmatrix} 0 & 6 \\ -5 & -15 \end{bmatrix}=\begin{bmatrix} -12 & 22 \\ -27 & 33 \end{bmatrix}$.

$4n-5=-27 \qquad n=\frac{-22}{4}=\frac{-11}{2}=-5\frac{1}{2}=-5.5$

4. Find the inverse of $A=\begin{bmatrix} 6 & -3 \\ 8 & -2 \end{bmatrix}$, if it exists.

Switch CHANGE $\pm$ by det.

$\begin{bmatrix} -2 & \\ & 6 \end{bmatrix} \quad \begin{bmatrix} & 3 \\ -8 & \end{bmatrix}$

$(6)(-2)-(8)(-3)$
$-12+24$
12

So A^{-1} $\begin{bmatrix} \frac{-2}{12} & \frac{3}{12} \\ \frac{-8}{12} & \frac{6}{12} \end{bmatrix}=\begin{bmatrix} \frac{-1}{6} & \frac{1}{4} \\ \frac{-2}{3} & \frac{1}{2} \end{bmatrix}$

5. Let $A=\begin{bmatrix} -8 & 1 \\ 4 & -5 \end{bmatrix}$ and $B=\begin{bmatrix} 6 & 4 \\ -7 & -1 \end{bmatrix}$. Find $A+5B$.

$A=\begin{bmatrix} -8 & 1 \\ 4 & -5 \end{bmatrix} \quad 5B=\begin{bmatrix} 30 & 20 \\ -35 & -5 \end{bmatrix}=\begin{bmatrix} 22 & 21 \\ -31 & -10 \end{bmatrix}$

6. Find $\begin{bmatrix} -15 & 7 \\ 72 & 8.6 \end{bmatrix} - \begin{bmatrix} -4 & -2 \\ 9 & 1 \end{bmatrix}$.

$= \begin{bmatrix} -15 - -4 & 7 - -2 \\ 72 - 9 & 8.6 - 1 \end{bmatrix} = \begin{bmatrix} -11 & 9 \\ 63 & 7.6 \end{bmatrix}$

7. Find the determinant of each 2 x 2 matrix:

$\begin{bmatrix} 13 & 4 \\ -5 & -1 \end{bmatrix}$

$-13 - -20$

7

$\begin{bmatrix} 7 & 6 \\ 6 & 5 \end{bmatrix}$

$35 - 36$

-1

$\begin{bmatrix} \frac{1}{2} & 20 \\ \frac{3}{4} & 8 \end{bmatrix}$

$4 - \frac{3}{4} \cdot 20^{5}$

$4 - 15$

-11

$\begin{bmatrix} -10 & \frac{2}{5} \\ 35 & 15 \end{bmatrix}$

$-150 - 35(\frac{2}{5})$

$-150 - 14$

-164

8. Find the product of $\begin{bmatrix} 3 & 1 \\ 5 & 2 \end{bmatrix}\begin{bmatrix} 2 & -1 \\ -5 & 3 \end{bmatrix}$.

$\begin{bmatrix} 6+5 & -3+3 \\ 10-10 & -5+6 \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

9. Find the values of w, x, y, and z that make the statement $\begin{bmatrix} 3x-5 & x+y \\ w^2-15 & \frac{4}{9}z \end{bmatrix} = \begin{bmatrix} 10 & 8 \\ 34 & 16 \end{bmatrix}$ true.

$3x - 5 = 10$

$3x = 15$

$x = 5$

$x + y = 8$

$5 + y = 8$

$y = 3$

$w^2 - 15 = 34$

$+15 \quad +15$

$\sqrt{w^2} = \sqrt{49}$

$w = 7, -7$

$\frac{4}{9} \cdot \frac{y}{4} z = 16 \cdot \frac{9}{4}$

$z = 36$

10. Solve the system of linear equations, $\begin{cases} 7m - 3n = 41 \\ 2m + 5n = 0 \end{cases}$ using Cramer's Rule.

(M) $x = \frac{D_x}{D} = \frac{\begin{vmatrix} 41 & -3 \\ 0 & 5 \end{vmatrix}}{\begin{vmatrix} 7 & -3 \\ 2 & 5 \end{vmatrix}} = \frac{205 - 0}{35 - -6} = \frac{205}{41} = 5$ $(5, -2)$

(N) $y = \frac{D_y}{D} = \frac{\begin{vmatrix} 7 & 41 \\ 2 & 0 \end{vmatrix}}{\begin{vmatrix} 7 & -3 \\ 2 & 5 \end{vmatrix}} = \frac{0 - 82}{35 - -6} = \frac{-82}{41} = -2$

EQUATIONS REVIEW

11. Solve the absolute value equation $|3x + 5| = 9$

{Remember, to solve an absolute value equation, you write the equation TWICE…one positive, one negative}

$|3x+5| = 9$

$3x+5=9$ $\quad -5 \quad -5$

$3x = 4$

$x = \frac{4}{3}$

$3x+5 = -9$ $\quad -5 \quad -5$

$3x = -14$

$x = -\frac{14}{3}$

12. Solve the equation: $7(4x - 5) + 20 = 19 - 8x + 11$

$28x - 35 + 20 = 19 - 8x + 11$

$28x - 15 = 30 - 8x$ $\quad +8x \quad +15 \quad +8x$

$\frac{36x}{36} = \frac{45}{36}$

$x = \frac{45}{36} = \frac{9.5}{9.4} = \frac{5}{4}$

13. Solve the equation: $\frac{3}{4}x + 44 = 62$

$\frac{3}{4}x + 44 = 62$

$-44 \quad -44$

$\frac{4}{3} \cdot \frac{3}{4}x = 18 \cdot \frac{4}{3}$

$x = 24$

$x = 24$

14. Solve the equation: $\frac{5}{2x+7} = \frac{9}{8-2x}$ {Hint: Cross Multiply}

$(5)(8-2x) = (9)(2x+7)$

$40 - 10x = 18x + 63$

$-63 + 10x \quad +10x - 63$

$\frac{-23}{28} = \frac{28x}{28}$

$\frac{-23}{28} = x$

$x = \frac{-23}{28}$

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Name_____

Adding/Subtracting Decimals

Date_____ Period____

Find each sum.

1) $5.4 + (-9.7)$

9.7
−5.4
4.3

5.4 − 9.7

−4.3

2) $10.8 + (-4.73)$

3) $(-0.5) + 0.3$

−.2

4) $(-4.79) + (-0.4)$

5) $3.305 + 1.7$

1.7

5.005

6) $(-3.6) + 0.43$

7) $(-4.3) + 14.5$

14.5
− 4.3
10.2

8) $(-7.1) + 3.63$

9) $13.7 + 3.2$

10) $(-10.9) + 6.1$

Find each difference.

11) $2.2 - 7.3$

12) $(-8.1) - (-8.9)$

13) $2.9 - 9.4$

14) $(-3.9) - 8.9$