★Don't forget Area of △ is $\frac{1}{2}|\det|$★

Name Key Date _____ Pd _____

**CYU 1.5.4 Determinants & Inverses with Matrices**

☑ *Use when you get it right all by yourself*

***S*** *Use when you did it all by yourself, but made a silly mistake*

***H*** *Use when you could do it alone with a little help from teacher or peer*

***G*** *Use when you completed the problem in a group*

***X*** *Use when a question was attempted but wrong (get help)*

***N*** *Use when a question was not even attempted*

| CONCEPTS | BASIC | INTERMEDIATE | ADVANCED |
|---|---|---|---|
| 2x2 Determinant | 1 - 4 | | |
| 3x3 Determinant | | 5 - 8 | |
| Inverse Matrices | | 11 - 12 | 9 – 10, 13, 14 |

*Evaluate each determinant. Show your work for full credit, but check your answer with the calculator.*

1. $\begin{vmatrix} -1 & 2 \\ 1 & -4 \end{vmatrix}$ 2

2. $\begin{vmatrix} 3 & 5 \\ -5 & -2 \end{vmatrix}$ 19

3. $\begin{vmatrix} -4 & 4 \\ -5 & -3 \end{vmatrix}$ 32

4. $\begin{vmatrix} -2 & 3 \\ 0 & 5 \end{vmatrix}$ −10

5. $\begin{vmatrix} -5 & 2 & 1 \\ 1 & 0 & 0 \\ 0 & 4 & 0 \end{vmatrix}$ 4

6. $\begin{vmatrix} -5 & -4 & 1 \\ -3 & 0 & 5 \\ -1 & 0 & 3 \end{vmatrix}$ −16

7. $\begin{vmatrix} 3 & 3 & 1 \\ -3 & -1 & -3 \\ -4 & -3 & 1 \end{vmatrix}$ 20

8. $\begin{vmatrix} -2 & 1 & -2 \\ 0 & 5 & -5 \\ 0 & 2 & -5 \end{vmatrix}$ 30

**Inverses:** *Find the inverse for each matrix provided, if defined. If undefined, explain in a complete sentence why the inverse does not exist.* Show all work for full credit. Check using your calculator.

9. $\begin{bmatrix} -3 & 1 \\ 9 & -1 \end{bmatrix}$ $\begin{bmatrix} \frac{1}{6} & \frac{1}{6} \\ \frac{3}{2} & \frac{1}{2} \end{bmatrix}$

10. $\begin{bmatrix} -3 & -3 \\ -4 & -3 \end{bmatrix}$ $\begin{bmatrix} 1 & -1 \\ -\frac{4}{3} & 1 \end{bmatrix}$

11. $\begin{bmatrix} -2 & 5 & -2 \\ -2 & 2 & 0 \\ -3 & -2 & 2 \end{bmatrix}$ $\begin{bmatrix} -\frac{1}{2} & \frac{3}{4} & -\frac{1}{2} \\ -\frac{1}{2} & \frac{5}{4} & -\frac{1}{2} \\ -\frac{5}{4} & \frac{19}{8} & -\frac{3}{4} \end{bmatrix}$

12. $\begin{bmatrix} 1 & 1 & -2 \\ -3 & -2 & 5 \\ -6 & 4 & 4 \end{bmatrix}$ $\begin{bmatrix} -14 & -6 & \frac{1}{2} \\ -9 & -4 & \frac{1}{2} \\ -12 & -5 & \frac{1}{2} \end{bmatrix}$

13. For what value(s) of x does matrix M have an inverse?

$$M = \begin{bmatrix} x & 1 \\ 2 & x+1 \end{bmatrix}$$

Already a square matrix, so to guarantee an inverse $\det \neq 0$, so, $x \neq -2$ or 1.

14. When does a matrix not have an inverse? Name 2 ways and why.

1) if not a square matrix 2) if $\det = 0$

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**CYU Reflection:** *How far can you go: basic, intermediate, or advanced?*

**Rate your mastery level!**

How confident are you with the skills this CYU covered? Circle the score you would give yourself.