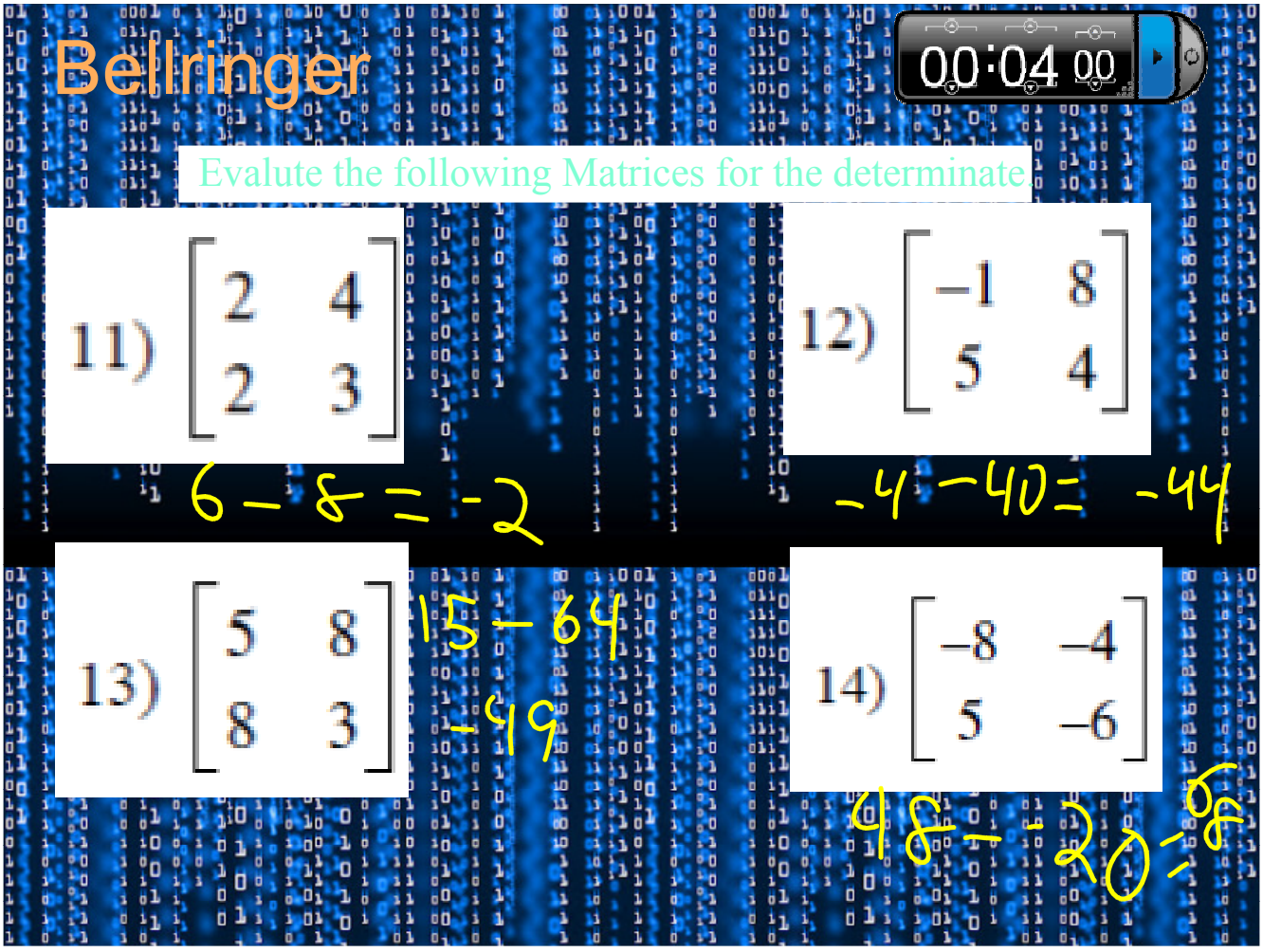
Bellringer
00:04 00
Evalute the following Matrices for the determinate
11) $\begin{bmatrix} 2 & 4 \\ 2 & 3 \end{bmatrix}$
12) $\begin{bmatrix} -1 & 8 \\ 5 & 4 \end{bmatrix}$
13) $\begin{bmatrix} 5 & 8 \\ 8 & 3 \end{bmatrix}$
14) $\begin{bmatrix} -8 & -4 \\ 5 & -6 \end{bmatrix}$
6 - 8 = -2
-4 - 40 = -44
15 - 64
-49
48 - 20 = 68

Homework #7: Determinants

Evaluate each determinant.

1) $\begin{vmatrix} 3 & -4 \\ 8 & 0 \end{vmatrix}$

2) $\begin{vmatrix} 0 & 8 \\ 2 & 1 \end{vmatrix}$

3) $\begin{vmatrix} 7 & 8 \\ 5 & 8 \end{vmatrix}$

4) $\begin{vmatrix} -7 & -4 \\ -7 & 8 \end{vmatrix}$

5) $\begin{vmatrix} -1 & -5 \\ -5 & 6 \end{vmatrix}$

6) $\begin{vmatrix} 3 & 0 \\ 0 & -2 \end{vmatrix}$

7) $\begin{vmatrix} -4 & 0 \\ -2 & 7 \end{vmatrix}$

8) $\begin{vmatrix} 6 & 4 \\ -2 & -3 \end{vmatrix}$

9) $\begin{vmatrix} -8 & 0 \\ 3 & -4 \end{vmatrix}$

$32 - 0 = 32$

10) $\begin{vmatrix} -4 & 4 \\ 0 & 5 \end{vmatrix}$

$-20 - 0 = -20$

Evaluate the determinant of each matrix.

11) $\begin{bmatrix} 2 & 4 \\ 2 & 3 \end{bmatrix}$

12) $\begin{bmatrix} -1 & 8 \\ 5 & 4 \end{bmatrix}$

13) $\begin{bmatrix} 5 & 8 \\ 8 & 3 \end{bmatrix}$

14) $\begin{bmatrix} -8 & -4 \\ 5 & -6 \end{bmatrix}$

15) $\begin{bmatrix} -5 & 8 \\ -7 & -7 \end{bmatrix}$

16) $\begin{bmatrix} -2 & -4 \\ -2 & -8 \end{bmatrix}$

17) $\begin{bmatrix} 1 & 0 \\ -5 & -8 \end{bmatrix}$

18) $\begin{bmatrix} 5 & -5 \\ 0 & 0 \end{bmatrix}$

19) $\begin{bmatrix} -6 & 4 \\ 3 & -1 \end{bmatrix}$

$6 - 12 = -6$

20) $\begin{bmatrix} 8 & 0 \\ -2 & -1 \end{bmatrix}$

$-8 - 0 = -8$

Inverse Matrices (2 x 2)

When you multiply two matrices together, in the order AB **or** BA, and the result is the **identity matrix**, then matrices A and B are **inverses**.

$$I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

Identity matrix

The **determinant** is used to tell us if an inverse exists.

If **det ≠ 0**, an inverse exists. If **det = 0**, no inverse exists.

For each matrix state if an inverse exists

$$\begin{vmatrix} a & b \\ c & d \end{vmatrix} = ad - bc$$

$\begin{bmatrix} 4 & -4 \\ 5 & -4 \end{bmatrix}$ Yes	$\begin{bmatrix} 2 & 3 \\ 8 & 12 \end{bmatrix}$ no $24-24=0$	$\begin{bmatrix} 4 & 6 \\ -9 & 5 \end{bmatrix}$ Yes
$\begin{bmatrix} 0 & -10 \\ -6 & -1 \end{bmatrix}$ Yes	$\begin{bmatrix} 6 & -6 \\ 1 & -1 \end{bmatrix}$ no	$\begin{bmatrix} 9 & -9 \\ 2 & 2 \end{bmatrix}$ Yes

102615 Lesson 8 The Inverse of a Matrix Notes

The inverse of a matrix A, written A^{-1}, is the matrix such that:

$$A A^{-1} = I = A^{-1} A$$

If $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$ then $A^{-1} = \frac{1}{ad - bc}\begin{bmatrix} d & -b \\ -c & a \end{bmatrix}$

a and *d* change position

The determinant of A

c and *b* change sign

$\begin{bmatrix} 4 & -4 \\ 5 & -4 \end{bmatrix}$ $\frac{1}{4}\begin{bmatrix} -4 & 4 \\ -5 & 4 \end{bmatrix}$	$\begin{bmatrix} 2 & 3 \\ 8 & 12 \end{bmatrix}$ no inverse	$\begin{bmatrix} 4 & 6 \\ -9 & 5 \end{bmatrix}$ $\frac{1}{74}\begin{bmatrix} 5 & -6 \\ 9 & 4 \end{bmatrix}$
$\begin{bmatrix} -3 & 4 \\ -2 & 5 \end{bmatrix}$ $(-3)(5)-(4)(-2)$ -7 $\frac{1}{-7}\begin{bmatrix} 5 & -4 \\ 2 & -3 \end{bmatrix}$	$\begin{bmatrix} 3 & -8 \\ -6 & 16 \end{bmatrix}$ no inverse	$\begin{bmatrix} 8 & 12 \\ 4 & 7 \end{bmatrix}$ $\frac{1}{8}\begin{bmatrix} 7 & -12 \\ -4 & 8 \end{bmatrix}$
$\begin{bmatrix} -1 & -3 \\ 1 & 2 \end{bmatrix}$ $\frac{1}{1}\begin{bmatrix} 2 & 3 \\ -1 & -1 \end{bmatrix}$ $-2-3=1$	$\begin{bmatrix} 9 & 3 \\ 8 & -5 \end{bmatrix}$ -69 $\frac{1}{-69}\begin{bmatrix} -5 & -3 \\ -8 & 9 \end{bmatrix}$	$\begin{bmatrix} -6 & 4 \\ 6 & 5 \end{bmatrix}$ $\frac{1}{-54}\begin{bmatrix} 5 & -4 \\ -6 & -6 \end{bmatrix}$
$\begin{bmatrix} 11 & 8 \\ -5 & 10 \end{bmatrix}$	$\begin{bmatrix} 5 & -1 \\ 5 & 10 \end{bmatrix}$	$\begin{bmatrix} -6 & 3 \\ 5 & -7 \end{bmatrix}$