BE-PRECALC | MONDAY 9-14-09

NOTE: OCT. 24 REGISTRATION DUE DATE IS FRI. 9-18!

The Real ACT 2ND Ed PG. 164-177

① WHAT IS THE SLOPE-INTERCEPT FORM OF $8x-y-6=0$

② WHAT IS THE x-COORDINATE OF THE POINT IN THE STANDARD (x, y) COORDINATE PLANE AT WHICH THE 2 LINES $y=2x+6$ AND $y=3x+4$ INTERSECT?

③ IF $a=b+2$, THEN $(b-a)^4=?$

④ FOR ALL POSITIVE INTEGERS x, y, AND z, WHICH OF THE FOLLOWING EXPRESSIONS IS EQUIVALENT TO $\frac{x}{y}$?

Ⓐ $\frac{x \cdot z}{y \cdot z}$ Ⓑ $\frac{x \cdot x}{y \cdot y}$ Ⓒ $\frac{y \cdot x}{x \cdot y}$ Ⓓ $\frac{x-z}{y-z}$ Ⓔ $\frac{x+z}{y+z}$

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① $8x-y-6=0$

$y=8x-6$

② $y=2x+6$

$y=3x+4$

$2x+6=3x+4$

$-2x-4 \quad -2x-4$

$2=x$

③ $a=b+2$

$-2 \quad -2$

$-2+a=b$

$-a \quad -a$

$-2=b-a$

$\therefore (b-a)^4$

$=(-2)^4=16$

④ $\frac{x}{y} \cdot \frac{z}{z}=\frac{x}{y}$

ANSWER A

LOOK: $(-2)^4=16$

$-2^4=-16$

(Be careful)

MATRIX — A RECTANGULAR ARRANGEMENT OF NUMBERS OR VARIABLES. A MATRIX HAS ROWS ↔ AND COLUMNS ↕

BRACKETS — USED TO INDICATE A MATRIX. MATRICES ARE NAMED LIKE VARIABLES

(EX) $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ $B = \begin{bmatrix} 5 & 6 \\ 7 & 8 \end{bmatrix}$

Vocabulary: Matrices are identified by the number of rows, then the number of columns.

(EX) $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{bmatrix}$ is a 3×2 matrix ← dimension of the matrix

$M \times N$

↑ rows ↑ columns

Elements: the individual terms in a matrix

$A = \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix}$ a_{11} = 1st row, 1st column

a_{21} = 2nd row, 1st column

A 1 row matrix is called a row matrix

(Ex) $\begin{bmatrix} 1.2 & 3.4 & 5.6 \end{bmatrix}$ is a 1×3 row matrix

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A 1 column matrix is called a column matrix

(Ex) $\begin{bmatrix} 5 \\ 6 \\ 7 \end{bmatrix}$ is a 3×1 column matrix

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Same number of rows and columns is a <u>square matrix</u>, also called an N^{th} order matrix.

(Ex) A 4th order square matrix

$$\begin{bmatrix} 1 & 2 & 3 & 4 \\ 2 & 3 & 4 & 5 \\ 3 & 6 & 7 & 8 \\ 4 & 9 & 10 & 11 \end{bmatrix} \Rightarrow 4 \times 4$$

- For matrices to be equal, all corresponding elements must be equal. $\begin{bmatrix} a \\ b \end{bmatrix} = \begin{bmatrix} 3 \\ 4 \end{bmatrix}$ means $a = 3$, $b = 4$

* Add or subtract matrices, + or − corresponding elements

$$A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} \quad B = \begin{bmatrix} 5 & 6 \\ 7 & 8 \end{bmatrix} \quad A + B = \begin{bmatrix} 6 & 8 \\ 10 & 12 \end{bmatrix}$$

* MUST BE SAME DIMENSIONS TO + or −

SCALAR ⇒ number

TO MULTIPLY A MATRIX BY A SCALAR, multiply each element.

(EX) $A = \begin{bmatrix} 2 & 3 \\ 4 & 5 \\ 6 & 7 \end{bmatrix}$ $3A = \begin{bmatrix} 6 & 9 \\ 12 & 15 \\ 18 & 21 \end{bmatrix}$

Ch. 2-3 Modeling Real World Data with Matrices

determinant (OF A SQUARE MATRIX ONLY!) — A number that is a basic property of a matrix. Among its uses are solving equations using matrices

SYMBOL $|N \times N|$ (EX) $\begin{vmatrix} a & b \\ c & d \end{vmatrix}$ read, the determinant of the matrix

CAUTION: $\begin{vmatrix} a & b \\ c & d \end{vmatrix}$ LOOKS LIKE $\begin{bmatrix} a & b \\ c & d \end{bmatrix}$

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

(EX) Ex 1 Pg 98 Find $\begin{vmatrix} 8 & 4 \\ 7 & 6 \end{vmatrix}$ use arrows ⇒ $\begin{vmatrix} 8 & 4 \\ 7 & 6 \end{vmatrix}$ −

$= (8 \cdot 6) - (4 \cdot 7)$

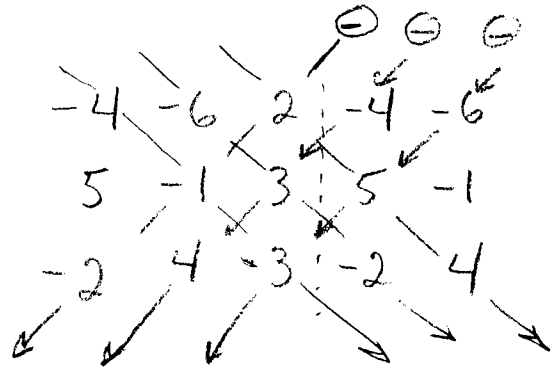
$48 - 28 = \boxed{20}$

Determinants of 3rd order matrices can be found using arrows just like 2nd order, but you have to repeat the 1st two columns to "complete" each arrow path:

EX 2 Pg 99

USE THIS METHOD OF ARROWS!

Find $\begin{vmatrix} -4 & -6 & 2 \\ 5 & -1 & 3 \\ -2 & 4 & -3 \end{vmatrix}$



$(4 \cdot -1 \cdot -3) + (-6 \cdot 3 \cdot -2) + (2 \cdot 5 \cdot 4) - (2 \cdot -1 \cdot -2) - (43 \cdot 4) - (-6 \cdot 5 \cdot -3)$

$(-12) + (36) + (40) - (4) + (48) - (90)$

$24 + 40 + 48 - 54$

$112 - 94 = \boxed{18}$

Homework: Pg 102 #15-21