Algebra 2 3.7

Evaluate determinants

Use Cramer's rule to solve systems of equations

second order determinant 2 × 2

third order determinant 3 × 3

Cramer's rule

coefficient matrix

variable matrix

whiteboards

Quiz 3.5-3.6

graphing calcs Thurs.

GuidedPractice

1A. $\begin{vmatrix} -6 & -7 \\ 10 & 8 \end{vmatrix}$ -70 $-48+70=22$ -48

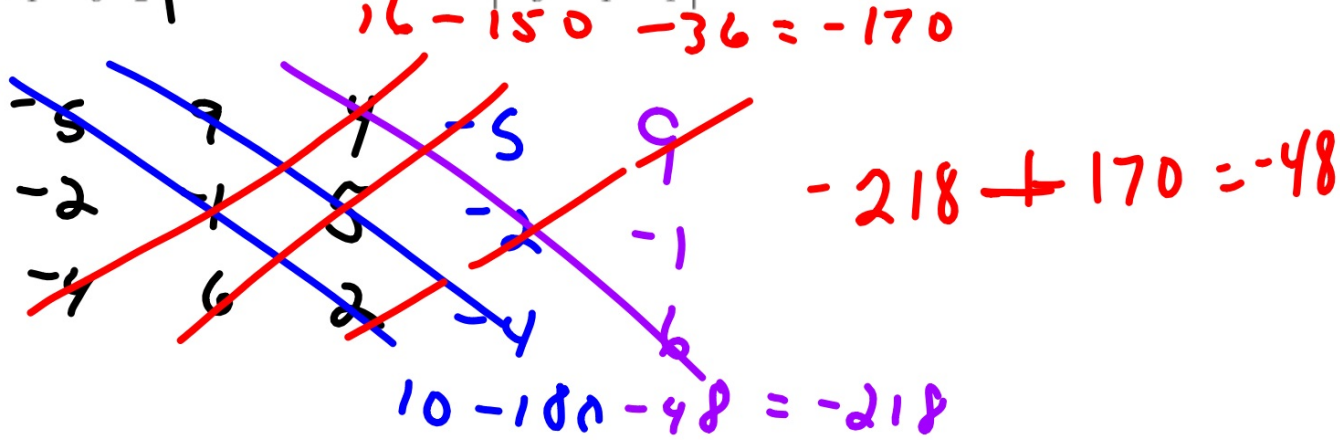
1B. $\begin{vmatrix} 7 & 5 \\ 9 & -4 \end{vmatrix}$

GuidedPractice

Evaluate each determinant.

2A. $\begin{vmatrix} -5 & 9 & 4 \\ -2 & -1 & 5 \\ -4 & 6 & 2 \end{vmatrix}$

2B. $\begin{vmatrix} -8 & -4 & 4 \\ 0 & -5 & -8 \\ 3 & 4 & 1 \end{vmatrix}$



KeyConcept Cramer's Rule

Let C be the coefficient matrix of the system $\begin{aligned} ax + by &= m \\ fx + gy &= n \end{aligned} \rightarrow \begin{bmatrix} a & b \\ f & g \end{bmatrix}$.

The solution of this system is $x = \dfrac{\begin{vmatrix} m & b \\ n & g \end{vmatrix}}{|C|}$ and $y = \dfrac{\begin{vmatrix} a & m \\ f & n \end{vmatrix}}{|C|}$, if $|C| \neq 0$.

coefficient matrix (C)

Cramer's rule: systems of 2 eq

$$8x - 5y = 70$$
$$9x + 7y = 3$$

$$\begin{vmatrix} 8 & -5 \\ 9 & 7 \end{vmatrix} = 56 + 45$$

-45

56

$$x = \begin{vmatrix} 70 & -5 \\ 3 & 7 \end{vmatrix} \quad 490 + 15$$

-15

$$y = \begin{vmatrix} 8 & 70 \\ 9 & 3 \end{vmatrix} \quad 24 - 630$$

490

630

-606

$$\frac{505}{101}, \frac{-606}{101}$$

$5 \quad -6$

$(5, -6)$

$$\begin{bmatrix} 5 \\ -6 \end{bmatrix}$$

5B. $6x + 5y + 2z = -1$

$-x + 3y + 7z = 12$

$5x - 7y - 3z = -52$

$-\frac{1536}{384}, \frac{1920}{384}, \frac{-384}{384}$

$x = -4$

$y = 5$

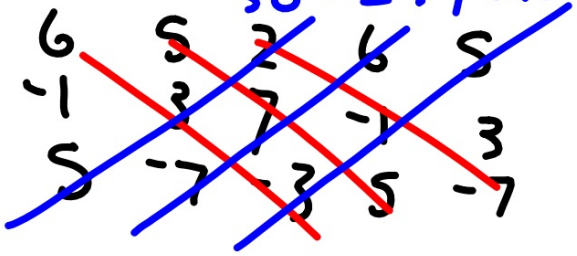
$z = -1$

WB 3.7 prob. 1-20

30 − 294 + 15 = −249

135 + 249

−54 + 175 + 14 = 135



Cramer's rule system of 3 eq

graphing calcs

2x2 Show the work
3x3+ Can use calc