

4.10 Matrices

AP Precalculus

4.10 Practice Solutions

Directions: Simplify the following matrices to a single matrix.

1) $\begin{bmatrix} 4 & 8 \\ -3 & -2 \\ 1 & 0 \end{bmatrix} - \begin{bmatrix} 10 & 4 \\ 9 & -8 \\ -8 & -6 \end{bmatrix}$

$\begin{bmatrix} -6 & 4 \\ -12 & 6 \\ 9 & 6 \end{bmatrix}$

2) $\begin{bmatrix} 4 & -9 & 8 & 1 \\ 10 & -13 & 2 & 9 \\ 6 & 4 & -2 & 5 \end{bmatrix} + 2 \begin{bmatrix} 1 & 0 & 2 & -3 \\ 3 & -3 & 6 & 4 \\ -4 & 2 & 3 & 5 \end{bmatrix}$

$\begin{bmatrix} 4 & -9 & 8 & 1 \\ 10 & -13 & 2 & 9 \\ 6 & 4 & -2 & 5 \end{bmatrix} + \begin{bmatrix} 2 & 0 & 4 & -6 \\ 6 & -6 & 12 & 8 \\ -8 & 4 & 6 & 10 \end{bmatrix}$

$\begin{bmatrix} 6 & -9 & 12 & -5 \\ 16 & -19 & 14 & 17 \\ -2 & 8 & 4 & 15 \end{bmatrix}$

3) $-3 \begin{bmatrix} 4 & -3 \\ -2 & 9 \end{bmatrix} + 4 \begin{bmatrix} 0 & 2 \\ -3 & 5 \end{bmatrix}$

$\begin{bmatrix} -12 & 9 \\ 6 & -27 \end{bmatrix} + \begin{bmatrix} 0 & 8 \\ -12 & 20 \end{bmatrix}$

$\begin{bmatrix} -12 & 17 \\ -6 & -7 \end{bmatrix}$

4) $[4 \ 3 \ -2] - 5[-4 \ 2 \ 0]$

$[4 \ 3 \ -2] + [20 \ -10 \ 0]$

$[24 \ -7 \ -2]$

Directions: Determine if the following matrices can be multiplied. If so, determine the dimensions of the multiplied matrix.

5) $(5 \times 8) \times (8 \times 7)$

(5×7)

6) $(3 \times 7) \times (3 \times 7)$

NOT Possible

7) $(9 \times 10) \times (10 \times 1)$

9×1

Directions: Multiply the following matrices. No Calculators.

8) $\begin{bmatrix} 3 & 5 \\ 4 & -9 \\ -4 & 0 \end{bmatrix} \cdot \begin{bmatrix} 4 & 6 & 8 \\ -1 & 0 & 2 \end{bmatrix}$

$3 \times 2 \cdot 2 \times 3$

$\begin{bmatrix} 12+5 & 18+0 & 24+6 \\ 16+9 & 24+0 & 32+6 \\ -16+0 & -24+0 & -32+6 \end{bmatrix}$

$\begin{bmatrix} 17 & 18 & 30 \\ 25 & 24 & 38 \\ -16 & -24 & -26 \end{bmatrix}$

$1 \times 3 \cdot 3 \times 1 = 1 \times 1$

9) $\begin{bmatrix} 4 & 6 & 8 \\ -1 & 0 & 2 \end{bmatrix} \cdot \begin{bmatrix} 3 & 5 \\ 4 & -9 \\ -4 & 0 \end{bmatrix} =$

$2 \times 3 \cdot 3 \times 2 = 2 \times 2$

$\begin{bmatrix} 12+24+32 & 20+54+0 \\ -3+0+8 & -5+0+0 \end{bmatrix}$

$\begin{bmatrix} 68 & 74 \\ 5 & -5 \end{bmatrix}$

4×3

10) $[4 \ -10 \ 3] \cdot \begin{bmatrix} -4 \\ 6 \\ 9 \end{bmatrix}$

$[-16 + -60 + 27]$

$[-49]$

$1 \times 2 \quad 2 \times 4$

11) $\begin{bmatrix} 3 & 5 & -9 & 5 \\ -4 & 0 & 1 & -2 \end{bmatrix} \cdot \begin{bmatrix} 1 & 3 & -6 \\ 0 & 5 & -8 \\ 0 & 1 & 3 \\ 9 & -7 & 5 \end{bmatrix}$ $2 \times 4 \quad 4 \times 3$

$[3+0+45 \quad 9+25-9-35 \quad -18-40-27+25]$

$[-4+0+0+18 \quad -12+0+1+14 \quad 24+0+3+10]$

$\begin{bmatrix} 48 & -10 & -60 \\ -22 & 3 & 17 \end{bmatrix}$

12) $[-3 \ 5] \cdot \begin{bmatrix} 3 & -7 & 5 & -8 \\ 2 & 0 & 5 & -7 \end{bmatrix} = 1 \times 4$

$[-9+10 \quad 21+0 \quad -15+25 \quad 24-35]$

$[1 \quad 21 \quad 10 \quad -11]$

13) $\begin{bmatrix} 54 & -34.5 \\ 58.9 & 93.4 \end{bmatrix} \cdot \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} = 2 \times 2$

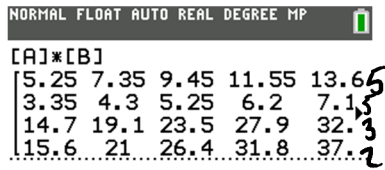
$[54+0 \quad 0+-34.5]$

$[58.9+0 \quad 0+93.4]$

$\begin{bmatrix} 54 & -34.5 \\ 58.9 & 93.4 \end{bmatrix}$

CALCULATOR ACTIVE: Directions: Multiply with a calculator.

14) $\begin{bmatrix} 0.4 & 1.3 & 2.5 \\ 1.2 & 0.5 & 0.2 \\ 4.2 & 3.4 & 1.2 \\ 2.1 & 5.4 & 3.3 \end{bmatrix} \cdot \begin{bmatrix} 2 & 2.5 & 3 & 3.5 & 4 \\ 1.5 & 2 & 2.5 & 3 & 3.5 \\ 1 & 1.5 & 2 & 2.5 & 3 \end{bmatrix}$



4.10 Matrices **4.10 Test Prep**

15) (1.11A) What is the second term when $(2a - b)^4$ is expanded?

- (A) $-32a^3b$
- (B) $-4a^2b^2$
- (C) $-16ab^3$
- (D) $-ab^4$

$4(2a)^3(-b)$

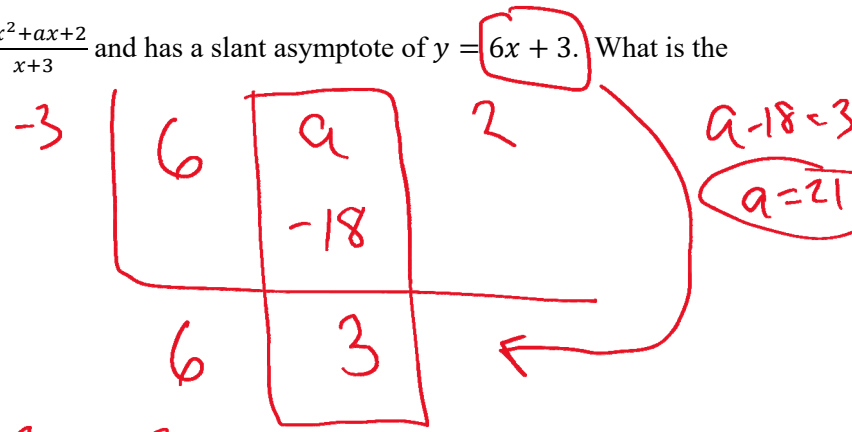
$4(8a^3)(-b)$

$-32a^3b$



16) (1.11B) The function f is given by $f(x) = \frac{6x^2+ax+2}{x+3}$ and has a slant asymptote of $y = 6x + 3$. What is the value of a ?

- (A) -4
- (B) 12
- (C) 15
- (D) 21**



17) (1.13)

x	2	4	6	8	10	12
$f(x)$	97	405	977	1861	3105	4757

Which of the following statements are true?

- (A) The function is quadratic because the second differences are a nonzero constant.
- (B) The function is quadratic because the third differences are a nonzero constant.
- (C) The function is cubic because the second differences are a nonzero constant.
- (D) The function is cubic because the third differences are a nonzero constant.**

