

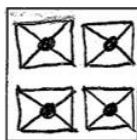
Zen Math

Matrix Multiplication

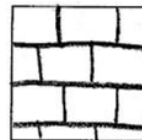
Matrix Multiplication Zen Math

Directions: Simplify the matrices using multiplication. Then, find the space on the abstract picture below that matches your answer. Fill that space with the given pattern. Show your work on a separate sheet of paper.

1. $\begin{bmatrix} -4 \\ -4 \end{bmatrix} \cdot \begin{bmatrix} 0 & 5 \end{bmatrix}$



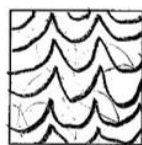
2. $\begin{bmatrix} 0 & -2 & 3 \\ -6 & 1 & -5 \end{bmatrix} \cdot \begin{bmatrix} -2 \\ -1 \\ -4 \end{bmatrix}$



3. $\begin{bmatrix} 3 \\ -4 \\ -6 \end{bmatrix} \cdot \begin{bmatrix} 5 & 0 \end{bmatrix}$



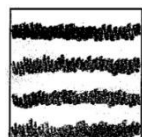
4. $\begin{bmatrix} -5x & 6 \end{bmatrix} \cdot \begin{bmatrix} -1 & 4x \\ 3y & 4 \end{bmatrix}$



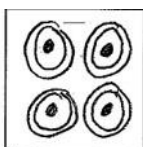
5. $\begin{bmatrix} 5x \\ 5 \end{bmatrix} \cdot \begin{bmatrix} 2y & -1 \end{bmatrix}$



6. $\begin{bmatrix} -2 & -1 & -1 \\ -6 & 5 & 2 \end{bmatrix} \cdot \begin{bmatrix} -3 & 3 \\ 5 & 4 \\ 5 & -6 \end{bmatrix}$



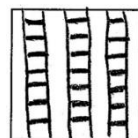
7. $\begin{bmatrix} -2 & -3 & -4 \\ 1 & 1 & 5 \end{bmatrix} \cdot \begin{bmatrix} -5 \\ 0 \\ -3 \end{bmatrix}$



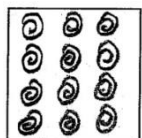
8. $\begin{bmatrix} -x \\ 4 \end{bmatrix} \cdot \begin{bmatrix} y & 2 \end{bmatrix}$



9. $\begin{bmatrix} 2x \\ 3y \\ -1 \end{bmatrix} \cdot \begin{bmatrix} -6y & -2 \end{bmatrix}$

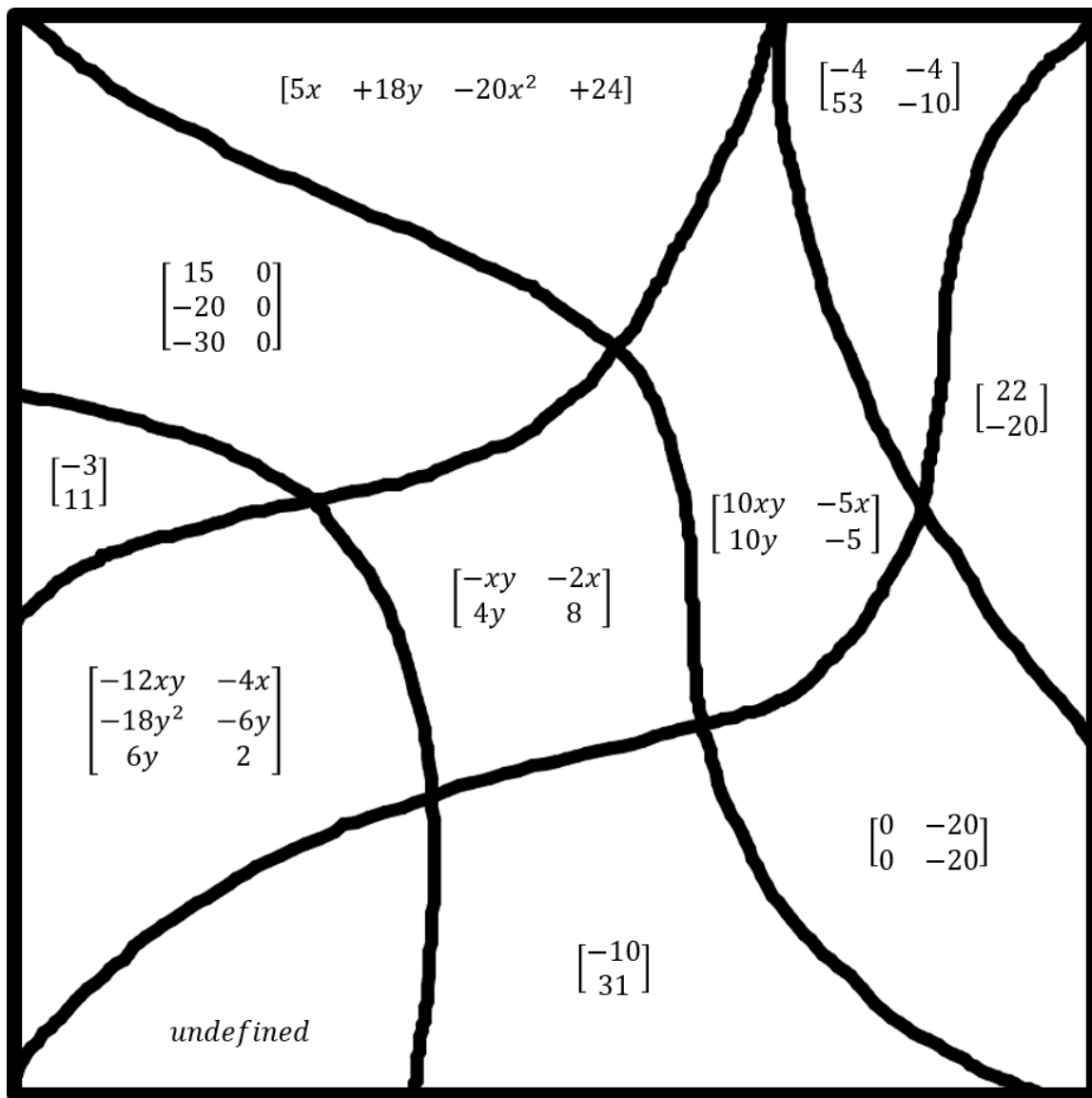


10. $\begin{bmatrix} -2x & 5y \end{bmatrix} \cdot \begin{bmatrix} 2 \\ 4x \\ -1 \end{bmatrix}$



11. $\begin{bmatrix} 0 & -3 \\ -5 & -4 \end{bmatrix} \cdot \begin{bmatrix} -3 \\ 1 \end{bmatrix}$



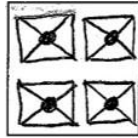


Matrix Multiplication Zen Math—Answer Key

Directions: Simplify the matrices using multiplication. Then, find the space on the abstract picture below that matches your answer. Fill that space with the given pattern. Show your work on a separate sheet of paper.

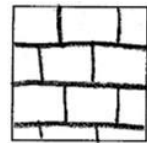
$$1. \begin{bmatrix} -4 \\ -4 \end{bmatrix} \cdot \begin{bmatrix} 0 & 5 \end{bmatrix}$$

$$\begin{bmatrix} 0 & -20 \\ 0 & -20 \end{bmatrix}$$



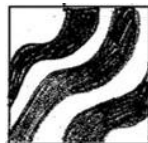
$$2. \begin{bmatrix} 0 & -2 & 3 \\ -6 & 1 & -5 \end{bmatrix} \cdot \begin{bmatrix} -2 \\ -1 \\ -4 \end{bmatrix}$$

$$\begin{bmatrix} -10 \\ 31 \end{bmatrix}$$



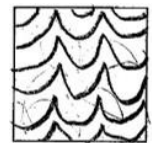
$$3. \begin{bmatrix} 3 \\ -4 \\ -6 \end{bmatrix} \cdot \begin{bmatrix} 5 & 0 \end{bmatrix}$$

$$\begin{bmatrix} 15 & 0 \\ -20 & 0 \\ -30 & 0 \end{bmatrix}$$



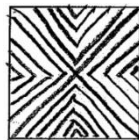
$$4. \begin{bmatrix} -5x & 6 \end{bmatrix} \cdot \begin{bmatrix} -1 & 4x \\ 3y & 4 \end{bmatrix}$$

$$\begin{bmatrix} 5x & +18y & -20x^2 & +24 \end{bmatrix}$$



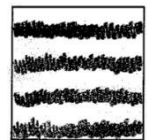
$$5. \begin{bmatrix} 5x \\ 5 \end{bmatrix} \cdot \begin{bmatrix} 2y & -1 \end{bmatrix}$$

$$\begin{bmatrix} 10xy & -5x \\ 10y & -5 \end{bmatrix}$$



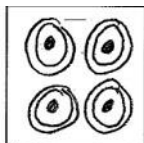
$$6. \begin{bmatrix} -2 & -1 & -1 \\ -6 & 5 & 2 \end{bmatrix} \cdot \begin{bmatrix} -3 & 3 \\ 5 & 4 \\ 5 & -6 \end{bmatrix}$$

$$\begin{bmatrix} -4 & -4 \\ 53 & -10 \end{bmatrix}$$



$$7. \begin{bmatrix} -2 & -3 & -4 \\ 1 & 1 & 5 \end{bmatrix} \cdot \begin{bmatrix} -5 \\ 0 \\ -3 \end{bmatrix}$$

$$\begin{bmatrix} 22 \\ -20 \end{bmatrix}$$



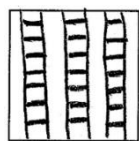
$$8. \begin{bmatrix} -x \\ 4 \end{bmatrix} \cdot \begin{bmatrix} y & 2 \end{bmatrix}$$

$$\begin{bmatrix} -xy & -2x \\ 4y & 8 \end{bmatrix}$$



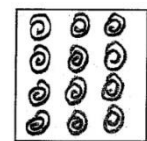
$$9. \begin{bmatrix} 2x \\ 3y \\ -1 \end{bmatrix} \cdot \begin{bmatrix} -6y & -2 \end{bmatrix}$$

$$\begin{bmatrix} -12xy & -4x \\ -18y^2 & -6y \\ 6y & 2 \end{bmatrix}$$



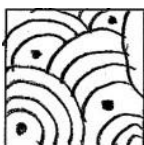
$$10. \begin{bmatrix} -2x & 5y \end{bmatrix} \cdot \begin{bmatrix} 2 \\ 4x \\ -1 \end{bmatrix}$$

$$\text{undefined}$$



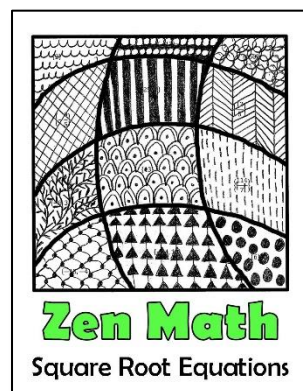
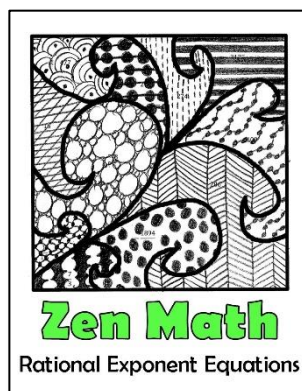
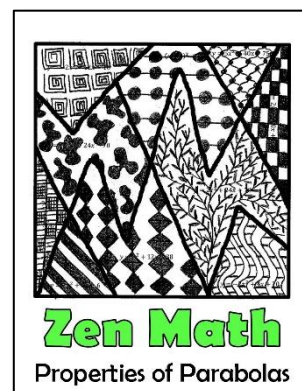
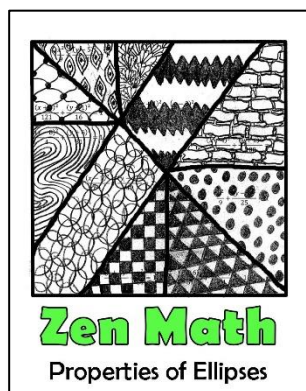
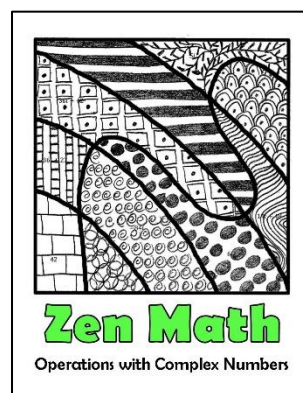
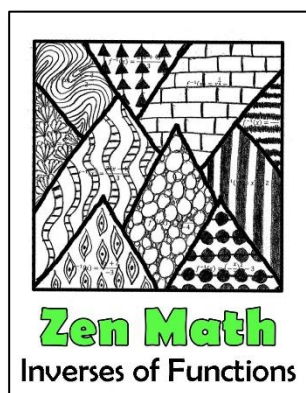
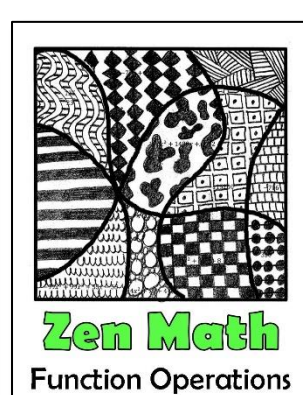
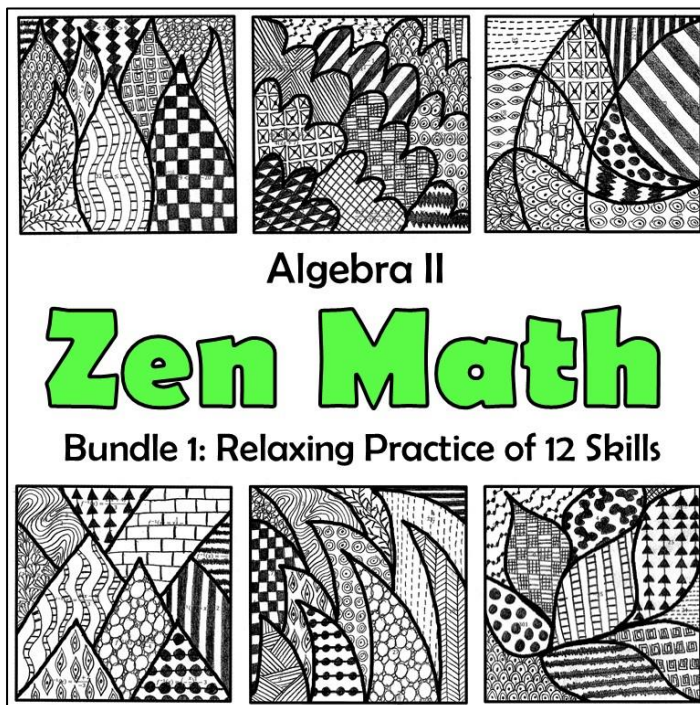
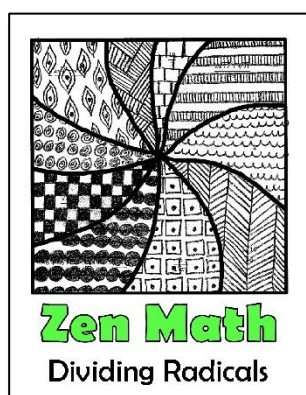
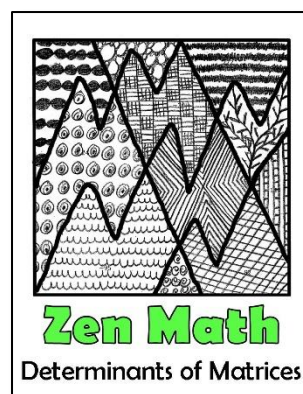
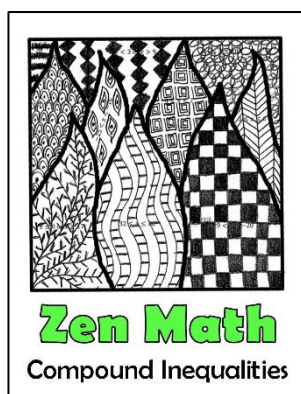
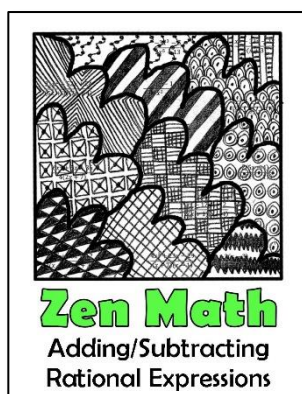
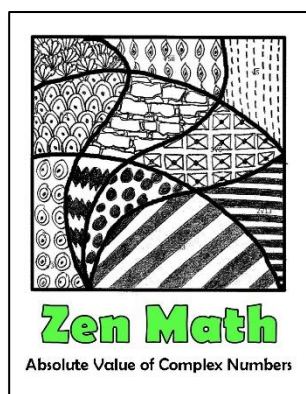
$$11. \begin{bmatrix} 0 & -3 \\ -5 & -4 \end{bmatrix} \cdot \begin{bmatrix} -3 \\ 1 \end{bmatrix}$$

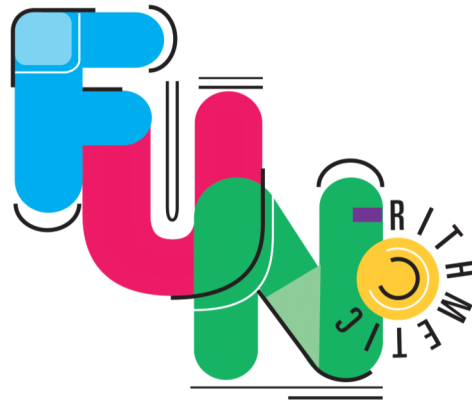
$$\begin{bmatrix} -3 \\ 11 \end{bmatrix}$$





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