

# Making Frozen Custard

Asked to find how many eggs, cream, & milk bakery needs for week days, weekends, holidays

	light custard	rich custard
eggs	1.5	2
cream	2.5	5
milk	5.5	3

	week day	Week end	holiday
light custard	6	6	8
rich custard	10	12	15

	week day	week end	holiday
eggs	$(1.5)(6) + 2(10)$ 29	$(1.5)(6) + 2(12)$ 33	$1.5(8) + 2(15)$ 42
cream	$2.5(6) + 5(10)$ 65	$2.5(6) + 5(12)$ 75	$2.5(8) + 5(15)$ 95
milk	$5.5(6) + 3(10)$ 63	$5.5(6) + 3(12)$ 69	$5.5(8) + 3(15)$ 89

# Making Profit on Pie

Apple Pie \$3  
 Cherry Pie \$4  
 Blueberry Pie \$2

	Mon.	Tues.	Wed.
Apple	13	9	7
Cherry	8	7	4
Blueberry	6	4	0

	Mon.	Tues.	Wed.
Profit	\$83	\$63	\$37
	↑	↑	↑
	$3(13) + 4(8) + 2(6)$	$3(9) + 4(7) + 2(4)$	$3(7) + 4(4) + 2(0)$

Calculating Total Points at Meet

	First Place	Second Place	Third Place	Points
KHS	4	7	3	15
WHS	2	8	1	10
YHS	1	8	4	5

Total Points

KHS	145	← 4(15) + 7(10) + 3(5)
WHS	115	← 2(15) + 8(10) + 1(5)
YHS	115	← 1(15) + 8(10) + 4(5)

3.6 Multiplying Matrices  
Honors Algebra 2

Process of Multiplying matrices:

$$\begin{bmatrix} a & b \\ c & d \end{bmatrix} \begin{bmatrix} e & f & g \\ h & i & j \end{bmatrix} = \begin{bmatrix} ae + bh & af + bi & ag + bj \\ ce + dh & cf + di & cg + dj \end{bmatrix}$$

Use the given matrices and perform the indicated operations, if possible:

$$A = \begin{bmatrix} 3 & 4 \\ 5 & 6 \end{bmatrix} \quad B = \begin{bmatrix} -3 & -4 & -5 \\ -1 & -2 & -3 \end{bmatrix} \quad C = \begin{bmatrix} 6 & 8 & 10 \\ 10 & 4 & 2 \\ -3 & 0 & 5 \end{bmatrix} \quad D = \begin{bmatrix} 3 & 6 \\ 9 & 12 \end{bmatrix}$$

$$(2 \times 2)(2 \times 3) = 2 \times 3$$

1. AB

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

$$= \begin{bmatrix} 3(-3) + 4(-1) & 3(-4) + 4(-2) & 3(-5) + 4(-3) \\ 5(-3) + 6(-1) & 5(-4) + 6(-2) & 5(-5) + 6(-3) \end{bmatrix}$$

$$= \begin{bmatrix} -13 & -20 & -27 \\ -21 & -32 & -43 \end{bmatrix}$$

$$(2 \times 2)(2 \times 2) = 2 \times 2$$

2. DA

$$= \begin{bmatrix} 3 & 6 \\ 9 & 12 \end{bmatrix} \begin{bmatrix} 3 & 4 \\ 5 & 6 \end{bmatrix}$$

$$= \begin{bmatrix} 9 + 30 & 12 + 36 \\ 27 + 60 & 36 + 72 \end{bmatrix}$$

$$= \begin{bmatrix} 39 & 48 \\ 87 & 108 \end{bmatrix}$$

$$(2 \times 3)(2 \times 2)$$

3. BD

$$= \begin{bmatrix} -3 & -4 & -5 \\ -1 & -2 & -3 \end{bmatrix} \begin{bmatrix} 3 & 6 \\ 9 & 12 \end{bmatrix}$$

$$= \begin{bmatrix} -3(3) + (-4)(9) + (-5) \\ \dots \end{bmatrix}$$

Can't multiply

No solution

What observations can you make about multiplying matrices?

row of 1st \* column of 2nd (multiply elements and add products together)

$$\begin{matrix} (r_1 \times c_1) * (r_2 \times c_2) = (r_1 \times c_2) \\ \swarrow \quad \searrow \\ \text{need to be} \\ \text{the same} \end{matrix}$$

need to be  
the same