

## EXAM I REVIEW Activity

$$\textcircled{1} \quad x\text{-int } (y=0) \Rightarrow 2x+0=7$$

$$x = 7/2 \Rightarrow \boxed{(7/2, 0)}$$

$$y\text{-int } (x=0) \Rightarrow 0+5y=7$$

$$y = 7/5 \Rightarrow \boxed{(0, 7/5)}$$

$$\textcircled{2} \quad \begin{array}{l} x+2y-z = -3 \\ 3x+5y-6z = 10 \end{array} \quad \left[ \begin{array}{ccc|c} 1 & 2 & -1 & -3 \\ 3 & 5 & -6 & 10 \end{array} \right] \xrightarrow{\text{rref}} \left[ \begin{array}{ccc|c} x & y & z & \\ 1 & 0 & -1 & 35 \\ 0 & 1 & 3 & -19 \end{array} \right]$$

$$\Rightarrow \begin{array}{l} x - 7z = 35 \Rightarrow x = 35 + 7z \\ y + 3z = -19 \Rightarrow y = -19 - 3z \end{array}$$

$$\text{SOLN: } (x, y, z) = (35 + 7t, -19 - 3t, t) \quad t = \text{any real \#}$$

$$\text{Specific Soln: } (t=0) \Rightarrow (35, -19, 0)$$

$$\textcircled{3} \quad \text{Pts: } (t, V) \rightarrow (0, 500) \underbrace{(5, 50)}_{y\text{-int}}$$

$t = \text{time (in yrs)}$

$V = \text{value (in \$)}$

$$m = \frac{50 - 500}{5 - 0} = -90$$

$$\Rightarrow V(t) = -90t + 500$$

$$\text{Value of } \$400 \Rightarrow 400 = -90t + 500$$

$$90t = 100$$

$$t = 100/90 = \boxed{10/9 \text{ yrs}} \quad (\approx 1.11 \text{ yrs})$$

④  $AX + B = C - X$

$AX + X = C - B$

$(A + I)X = C - B$

$X = (A + I)^{-1}(C - B)$

$AX + B = C - X$

or.  $B - C = -X - AX$

$B - C = (-I - A)X$

$X = (-I - A)^{-1}(B - C)$

⑤

$L_1 \rightarrow x$	0	2	5	9
$L_2 \rightarrow y$	5.2	6	7.5	8.2

① LinReg  $y_1 \rightarrow y = 0.3413x + 5.3598$

② Yes,  $r = 0.9758$  so  $|r| \geq 0.8$

③ 2010  $\rightarrow x = 10$

$y_1(10) = 8.7728 \dots \times 1000 = \boxed{\$8,773}$

④  $y_1 = \text{linreg line}$  } calc-intersect  $\Rightarrow x = 15.06 \dots$   
 $y_2 = 10.5$   
 $\uparrow \frac{10500}{1000}$   $\Downarrow$   
 $\boxed{2015}$

⑥

AB

$(2 \times 2)(2 \times 2)$   
 $\uparrow \quad \uparrow \quad \uparrow$   
time order    bakery co.    orders  
 $\neq$

$\Rightarrow \boxed{AB \text{ meaningless}}$

OK ROW by col  
 $\Rightarrow \text{RIC2: } (5 \frac{\text{min}}{\text{dough}})(60 \text{ kolaches}) + \dots$   
 doesn't make sense

BA

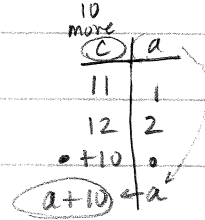
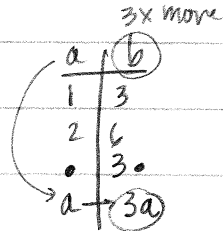
$(2 \times 2)(2 \times 2)$   
 $\uparrow \quad \uparrow \quad \uparrow$   
co.    orders    time order    bakery  
 both w/ orders

OK ROW by col.  $(50 \text{ dough})(6 \frac{\text{min}}{\text{dough}}) + (60 \text{ kol})(8 \frac{\text{min}}{\text{kol}})$   
 RIC2 = total time to fill co. c. order at Sunny Bakery.

$\Rightarrow \boxed{BA: \text{Total time to fill each co. order at each bakery}}$

- 7 (a) the same, different  
 (b) the same, the same

- 8 (a)  $c = a + b$   
 (b)  $b = 3a$   
 (c)  $c = a + 10$



9 (a) B.E.  $\Rightarrow R = C$  ( $P = 0$ )  $x = \#$  of books.

Cost

(100, 800)

$$m = \frac{900 - 800}{150 - 100} = 2$$

$$C - 800 = 2(x - 100)$$

(150, 900)

$$150 - 100$$

$$= 2x - 200$$

$$C(x) = 2x + 600$$

Rev

$$R(x) = 7.50x$$

$$B.E. \Rightarrow 7.5x = 2x + 600$$

$$5.5x = 600$$

$$x = \frac{1200}{11} \text{ books}$$

(b) NO, b/c you can't make/sell a fraction of a book.

$$\textcircled{10} \quad \begin{bmatrix} a & 0 \\ 1 & 5 \end{bmatrix} \overset{\text{transpose}}{\text{T}} + 2 \begin{bmatrix} 4 & 5 \\ 6 & 7 \end{bmatrix} \overset{\text{inverse}}{-1} = \begin{bmatrix} 3 & b \\ c & d \end{bmatrix}$$

$$\begin{bmatrix} a & 1 \\ 0 & 5 \end{bmatrix} + 2 \begin{bmatrix} -3.5 & 2.5 \\ 3 & -2 \end{bmatrix} = \begin{bmatrix} 3 & b \\ c & d \end{bmatrix}$$

$$\begin{bmatrix} a & 1 \\ 0 & 5 \end{bmatrix} + \begin{bmatrix} -7 & 5 \\ 6 & -4 \end{bmatrix} = \begin{bmatrix} 3 & b \\ c & d \end{bmatrix}$$

$$\begin{bmatrix} a-7 & 6 \\ b & 1 \end{bmatrix} = \begin{bmatrix} 3 & b \\ c & d \end{bmatrix}$$

$$a-7=3$$

$$b=b$$

$$b=c$$

$$1=d$$

$$a=10$$

$$\textcircled{11} \textcircled{a} \quad (x, p) \rightarrow (50, 0.75) \begin{matrix} 10\phi \text{ inc} \\ \swarrow \\ \searrow \end{matrix} \begin{matrix} m = \frac{0.85-0.75}{45-50} = -0.02 \\ \downarrow \\ \uparrow \end{matrix} \begin{matrix} (45, 0.85) \\ \swarrow \\ \searrow \end{matrix}$$

$$p-0.75 = -0.02(x-50)$$

$$= -0.02x + 1$$

$$p = -0.02x + 1.75$$

$$\textcircled{b} \text{ Free} \Rightarrow p=0 \Rightarrow 0 = -0.02x + 1.75$$

$$0.02x = 1.75$$

$$x = 87.5 \text{ x } 88 \text{ cookies}$$

$$\textcircled{c} \quad S=D$$

$$\frac{1}{100}x + 0.1 = -0.02x + 1.75$$

$$p = \frac{1}{100}(55) + 0.1 = 0.65$$

$$0.03x = 1.65$$

$$x = 55$$

$$\text{EQ PT: } (55, 0.65)$$

(2) (a) NO

(b)  $2R_2: 0 \ 2 \ 8 \ 14$

$+ R_3: 0 \ -2 \ 3 \ 5$

$R_3: 0 \ 0 \ 11 \ 19$

$\longrightarrow$

$$\left[ \begin{array}{ccc|c} 1 & 0 & 0 & 8 \\ 0 & 1 & 4 & 7 \\ 0 & 0 & 11 & 19 \end{array} \right]$$