

121 TEST 5 TAKE-HOME VERSION 2 SOLNS

Let x = the amount invested in growth stocks (in \$)

y = " " " " Bonds "

z = " " " " Blue-Chip stocks "

TOTAL INVESTMENT IS \$6530

$$x + y + z = 6530$$

He invested twice as much in bonds as in growth stocks,

i.e. INVESTMENT IN BONDS IS TWICE the investment in growth stocks

$$y = 2x$$

$$-2x + y = 0$$

x, y, z earn @ rates of 10%, 5%, 2%, respectively, and total return was \$306.30

$$.1x + .05y + .02z = 306.3$$

AUGMENTED MATRIX:

$$\left[\begin{array}{ccc|c} 1 & 1 & 1 & 6530 \\ .1 & .05 & .02 & 306.3 \\ -2 & 1 & 0 & 0 \end{array} \right] \begin{array}{l} R1 \\ 10R2 \\ 2R1+R3 \end{array} \left[\begin{array}{ccc|c} 1 & 1 & 1 & 6530 \\ 1 & .5 & .2 & 306.3 \\ 0 & 3 & 2 & 13060 \end{array} \right]$$

$$\begin{array}{l} R1 \\ -R1+R2 \\ R3 \end{array} \left[\begin{array}{ccc|c} 1 & 1 & 1 & 6530 \\ 0 & -.5 & -.8 & -3467 \\ 0 & 3 & 2 & 13060 \end{array} \right] \begin{array}{l} R1 \\ -2R2 \\ R3 \end{array} \left[\begin{array}{ccc|c} 1 & 1 & 1 & 6530 \\ 0 & 1 & 1.6 & 6934 \\ 0 & 3 & 2 & 13060 \end{array} \right]$$

$$\begin{array}{l} R1 \\ R2 \\ -3R2+R3 \end{array} \left[\begin{array}{ccc|c} 1 & 1 & 1 & 6530 \\ 0 & 1 & 1.6 & 6934 \\ 0 & 0 & -2.8 & -7742 \end{array} \right]$$

$$\begin{aligned} x + y + z &= 6530 \\ y + 1.6z &= 6934 \\ -2.8z &= -7742 \end{aligned}$$

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(2)

So, $-2.8z = -7742$

$z = 2765$

$y + 1.6z = 6934$

$y + 1.6(2765) = 6934$

$y + 4424 = 6934$

$y = 2510$

$x + y + z = 6530$

$x + 2510 + 2765 = 6530$

$x + 5275 = 6530$

$x = 1255$

$\{(1255, 2510, 2765)\}$

CHECK:

$$\begin{bmatrix} 1 & 1 & 1 \\ .1 & .05 & .02 \\ -2 & 1 & 0 \end{bmatrix} \begin{bmatrix} 1255 \\ 2510 \\ 2765 \end{bmatrix} = \begin{bmatrix} 1255 + 2510 + 2765 \\ 125.5 + 125.5 + 55.3 \\ -2510 + 2510 \end{bmatrix}$$

$$= \begin{bmatrix} 6530 \\ 306.3 \\ 0 \end{bmatrix}$$