

MTH 152-MATRICES EXAM (MAT): SAMPLE EXAM

If M is a matrix then $M(r, c)$ denotes the element in row r , column c of M and M^{-1} is the inverse of matrix M

PROBLEM 1. The tickets to a concert on campus cost \$1.00 for students, \$1.50 for faculty and \$2.00 for others. Total attendance was 460 and the total receipts were \$570. There were 140 more students than faculty and others combined. The number of students attending the concert is closest to

- | | | | | |
|--------|--------|--------|--------|--------|
| A. 225 | B. 75 | C. 125 | D. 175 | E. 275 |
| F. 50 | G. 100 | H. 300 | I. 150 | J. 200 |

PROBLEM 2. The number of faculty attending the concert is closest to

- | | | | | |
|--------|--------|--------|--------|--------|
| A. 150 | B. 200 | C. 125 | D. 100 | E. 225 |
| F. 275 | G. 175 | H. 50 | I. 25 | J. 250 |

PROBLEM 3. The number of others attending the concert is closest to

- | | | | | |
|--------|--------|--------|--------|-------|
| A. 25 | B. 100 | C. 125 | D. 200 | E. 75 |
| F. 150 | G. 275 | H. 175 | I. 225 | J. 50 |
-

PROBLEM 4. The manager of a variety store has examined her sales receipts for two weeks. She noted that the first week the appliance department sold 2 toasters and 6 blenders for a profit of \$29.00. The second week the appliance department sold 3 toasters and 4 blenders for a profit of \$27.25. The profit on a toaster is closest to

- | | | | | |
|-----------|-----------|-----------|-----------|-----------|
| A. \$5.25 | B. \$5.50 | C. \$4.00 | D. \$3.75 | E. \$4.50 |
| F. \$4.25 | G. \$4.75 | H. \$6.00 | I. \$5.75 | J. \$3.50 |

PROBLEM 5. The profit on a blender is closest to

- | | | | | |
|-----------|-----------|-----------|-----------|-----------|
| A. \$2.50 | B. \$3.25 | C. \$2.75 | D. \$4.00 | E. \$3.50 |
| F. \$1.75 | G. \$4.25 | H. \$2.00 | I. \$3.00 | J. \$4.50 |
-

PROBLEM 6. Solve the equation

$$2x^2 + x - 1 = 0$$

The smaller solution, if any, is closest to

- | | | | | |
|-------|-------|-------|-------|-------|
| A. -4 | B. -8 | C. -2 | D. -7 | E. -6 |
| F. -5 | G. -9 | H. -3 | I. -1 | J. 0 |

EXAM CONTINUES ON BACK OF SHEET

MTH 152-MATRICES EXAM (MAT): SAMPLE EXAM

PROBLEM 7. Solve the system $\mathbf{AX} = \mathbf{C}$, if it is known that $\mathbf{A}^{-1} = \mathbf{B}$. Here are the matrices \mathbf{B} , \mathbf{C} and \mathbf{X} .

$$\mathbf{B} = \begin{pmatrix} 55 & -729 & 90 \\ -6 & 81 & -10 \\ -15 & 73 & -9 \end{pmatrix}, \mathbf{C} = \begin{pmatrix} -124 \\ -11878 \\ -96136 \end{pmatrix}, \mathbf{X} = \begin{pmatrix} x \\ y \\ z \end{pmatrix}.$$

Then x is closest to

- | | | | | |
|-------|------|--------|-------|--------|
| A. -6 | B. 3 | C. -12 | D. 12 | E. 0 |
| F. 6 | G. 9 | H. -9 | I. -3 | J. -18 |
-

PROBLEM 8. Find the equation of the line that passes through $(-4, -3)$ and $(20, -33)$ and put it into slope intercept form. The y -intercept is closest to

- | | | | | |
|-------|-------|------|-------|-------|
| A. -6 | B. -9 | C. 0 | D. -2 | E. -7 |
| F. -3 | G. -8 | H. 1 | I. -1 | J. -5 |
-

PROBLEM 9. To produce \$1 of industry Y output requires \$.30 of its own output and \$.00 of industry Z output. To produce \$1 of industry Z output requires \$.00 of its own output and \$.20 of industry Y output. If consumer demand is \$236 for industry Y output and \$640 for industry Z output, then the amount industry Y must produce is closest to

- | | | | | |
|----------|----------|----------|----------|----------|
| A. \$375 | B. \$625 | C. \$425 | D. \$575 | E. \$550 |
| F. \$400 | G. \$600 | H. \$500 | I. \$450 | J. \$525 |

PROBLEM 10. And the amount industry Z must produce is closest to.

- | | | | | |
|----------|----------|----------|----------|----------|
| A. \$550 | B. \$625 | C. \$725 | D. \$475 | E. \$675 |
| F. \$575 | G. \$500 | H. \$650 | I. \$700 | J. \$525 |
-

PROBLEM 11. Find the inverse of the matrix \mathbf{B} below.

$$\mathbf{B} = \begin{pmatrix} 1 & 4 & 24 \\ -5 & -19 & -115 \\ 0 & 0 & 1 \end{pmatrix}.$$

Then the entry $\mathbf{B}^{-1}(1,1)$ is closest to

- | | | | | |
|--------|--------|--------|--------|--------|
| A. -19 | B. -24 | C. -22 | D. -15 | E. -21 |
| F. -16 | G. -25 | H. -23 | I. -18 | J. -17 |
-

PROBLEM 12. Solve

$$A = \frac{h(b+c)}{2}$$

for c . Then $c =$

- | | | | | |
|----------------------|-----------------------|--------------------|-----------------------|---------------------|
| A. $\frac{A}{h} - b$ | B. $\frac{2A}{h} + b$ | C. $h(A - b)2$ | D. $\frac{-2A}{bh}$ | E. $\frac{-bh}{2A}$ |
| F. $\frac{2A}{hb}$ | G. $2A - h - b$ | H. $\frac{A-h}{b}$ | I. $\frac{2A}{h} - b$ | J. Not listed here. |

The correct answers are: 1-H, 2-D, 3-J, 4-G, 5-B, 6-I, 7-B, 8-G, 9-J, 10-H, 11-A, 12-I