

16. For what values of  $a$  do the lines  $2x+3y = 0$  and  $ax+6y = 5$  have a point in common?

- a.  $a = 4$     b. all values of  $a$     c.  $a \neq 4$     d.  $a \neq 2$     e. only  $a = 0$

17. Find the equation of the line perpendicular to the  $x$ -axis, with  $x$ -intercept  $(1,0)$  and  $y$ -intercept  $(0,1)$ .

- a. There is no such line.    b.  $x+y = 1$     c.  $x = 1$     d.  $y = 1$     e.  $x+y = 2$

18. Which of the following statements about the solution of the system

$$-x + 2z = 1$$

$$2x + 7y + 3z = 12$$

$$-x + 7y + 11z = 17$$
 is correct?

- a.  $x = -1$     b.  $x = 1$     c.  $z = \frac{1}{2}$     d. there is no solution    e.  $y = -1$

19. Let  $A$  be the matrix  $\begin{bmatrix} 2 & 1 & 1 \\ 0 & 1 & 0 \\ 0 & 1 & 1 \end{bmatrix}$  The element in the first row and third column of  $A^{-1}$  is

- a.  $\frac{1}{2}$     b. 0    c. 1    d.  $-\frac{1}{2}$     e. -1

20. Let A be an arbitrary 2x2 matrix and B an arbitrary 3x2 matrix. Which of the following statements is always true?

- a.  $B^2$  is defined      b. A has an inverse      c. AB is defined  
d.  $BA = B$       e.  $B(A^2)$  is defined

21. Given that  $A^{-1} = \begin{bmatrix} 1 & 1 & 0 \\ 0 & 1 & 1 \\ 1 & 0 & 2 \end{bmatrix}$  find the solution for x

in the matrix equation  $A \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 8 \\ 3 \\ 0 \end{bmatrix}$

- a.  $x = 10$       b.  $x = 8$       c.  $x = 3$       d.  $x = 11$       e.  $x = 1$

22. For  $A = \begin{bmatrix} 2 & 1 \\ -1 & 1 \end{bmatrix}$  find the entry in the second row and second column of  $A^{-1} + A^2 + I$  (where I is the 2x2 identity matrix).

- a. 1    b.  $\frac{2}{3}$       c.  $\frac{5}{3}$       d. 0      e. 5

