Alternate 5

Math 3321

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(1) Give the number of solutions to the system of equations

\[-x + 3y = 0\]
\[-3x + 9y = 0\]

(a) One solution.
(b) No solution.
(c) Infinitely many solutions.
(d) Two solutions.
(e) None of these.

(2) Solve for \(x\) and \(z\) in the given system of equations

\[
\begin{align*}
2x + 6y + 8z &= 16 \\
4x + 15y + 19z &= 38 \\
2x + 3z &= 6
\end{align*}
\]

(a) \(x = 0, z = 1\)
(b) \(x = 0, z = -2\)
(c) \(x = 0, z = 2\)
(d) \(x = 1, z = 1\)
(e) None of these.

(3) Determine the value of \(k\) so that the system of equations has infinitely many solutions

\[
\begin{align*}
2x - 3y &= kx \\
x - 2y &= ky
\end{align*}
\]

1
(a) \( k = 2 \)
(b) \( k = 0 \)
(c) \( k = 1 \) or \(-1\)
(d) \( k = 3 \)
(e) None of these.

(4) Determine the value of \( k \) below so that the system of equations has a unique solution

\[
\begin{align*}
2x - 3y &= kx \\
x - 2y &= ky
\end{align*}
\]

(a) \( k = 2 \)
(b) \( k = -1 \)
(c) \( k = 1 \)
(d) None of these.

(5) Give the number of solutions to the system of equations

\[
\begin{align*}
2x - y + z &= 3 \\
-x + 2y + z &= 1 \\
x + y + 2z &= 3
\end{align*}
\]

(a) One solution.
(b) No solution.
(c) Infinitely many solutions.
(d) Three solutions.
(e) None of these.

(6) Determine the value of \( k \) so that the system of equations is inconsistent

\[
\begin{align*}
-x + 3y &= 0 \\
-3x + ky &= 2
\end{align*}
\]
(a) $k = 2$
(b) $k = 0$
(c) $k = 1$
(d) $k = 9$
(e) None of these.

(7) Give $(2,4)$ entry of the row reduced echelon form of
\[
\begin{pmatrix}
1 & 2 & -3 & -4 \\
2 & 4 & -5 & -7 \\
-3 & -6 & 11 & 14
\end{pmatrix}.
\]

(a) 1
(b) $a$
(c) 0
(d) 1
(e) None of these.

(8) Give $(1,3)$ entry of the row reduced echelon form of
\[
\begin{pmatrix}
1 & a & 1 \\
0 & 2 & -2 \\
0 & 1 & -1
\end{pmatrix},
\]
where $a$ is a positive real number.

(a) $a$
(b) $a + 1$
(c) $a - 1$
(d) 0
(e) None of these.