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**ft-uiowa-math2550**
Assignment Hw1fall14 due 09/03/2014 at 10:56pm CDT

**1.**     **(1 pt)  Library/WHFreeman/Holt_linear_algebra/Chaps_1-4-/holt_01_02_007.pg**

Determine if the matrix

$$\begin{bmatrix} -2 & -3 & 1 & -1 & 0 \\ 0 & 0 & -5 & 1 & 0 \\ 0 & 0 & 1 & 0 & 0 \end{bmatrix}$$

is in echelon form, reduced row echelon form, or neither. Choose the *most appropriate* answer.

Answer: ? .

*Correct Answers:*

- not in echelon form

**2.**     **(1 pt)  Library/WHFreeman/Holt_linear_algebra/Chaps_1-4-/holt_01_02_006.pg**

Determine if the matrix

$$\begin{bmatrix} 1 & -8 & 0 & 3 & 8 \\ 0 & 0 & 1 & -4 & -4 \\ 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

is in echelon form, reduced row echelon form, or neither. Choose the *most appropriate* answer.

Answer: ? .

*Correct Answers:*

- reduced row echelon form

**3.**     **(1 pt)  Library/WHFreeman/Holt_linear_algebra/Chaps_1-4-/holt_01_02_010.pg**

Determine if the matrix

$$\begin{bmatrix} 1 & 9 & 0 & 6 & 0 \\ 0 & 0 & 1 & 3 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{bmatrix}$$

is in echelon form, reduced row echelon form, or neither. Choose the *most appropriate* answer.

Answer: ? .

*Correct Answers:*

- reduced row echelon form

**4.** **(1 pt) Library/TCNJ/TCNJ_LinearSystems/problem11.pg**

Give a geometric description of the following systems of equations.

? 1.
$$\begin{aligned} 7x &+ 7y &=& -6 \\ 6x &+ 5y &=& 8 \end{aligned}$$

? 2.
$$\begin{aligned} 4x &+ 4y &=& 6 \\ 8x &+ 8y &=& 13 \end{aligned}$$

? 3.
$$\begin{aligned} 4x &+ 4y &=& 6 \\ 8x &+ 8y &=& 12 \end{aligned}$$

*Correct Answers:*

- Two lines intersecting in a point
- Two parallel lines
- Two lines that are the same

**5. (1 pt) Library/TCNJ/TCNJ_LinearSystems/problem1.pg**

Determine whether the following system has no solution, an infinite number of solutions or a unique solution.

? 1.
$$\begin{aligned} -6x &+5y &=& 5 \\ -4x &+4y &=& 7 \\ -10x &+11y &=& 23 \end{aligned}$$

? 2.
$$\begin{aligned} -10x &+15y &=& 15 \\ 4x &-6y &=& -6 \\ 12x &-18y &=& -18 \end{aligned}$$

? 3.
$$\begin{aligned} -6x &+5y &=& 5 \\ -4x &+4y &=& 7 \\ -10x &+11y &=& 25 \end{aligned}$$

*Correct Answers:*

- Unique Solution
- Infinite Solutions
- No Solution

**6. (1 pt) Library/TCNJ/TCNJ_LinearSystems/problem3.pg**

Give a geometric description of the following systems of equations

? 1.
$$\begin{aligned} -4x &- 16y &=& -4 \\ 3x &+ 12y &=& 3 \\ 7x &+ 28y &=& 7 \end{aligned}$$

? 2.
$$\begin{aligned} x &- 3y &=& 5 \\ 2x &- 3y &=& 9 \\ 7x &- 9y &=& 31 \end{aligned}$$

? 3.
$$\begin{aligned} x &- 3y &=& 5 \\ 2x &- 3y &=& 9 \\ 7x &- 9y &=& 28 \end{aligned}$$

*Correct Answers:*

- Three identical lines
- Three lines intersecting at a single point
- Three non-parallel lines with no common intersection

**7.** (1 pt) Library/TCNJ/TCNJ_LinearSystems/problem2.pg

Determine whether the following system has no solution, an infinite number of solutions or a unique solution.

?|1.
$$\begin{aligned} -7x + 2y + 6z &= 3 \\ -9x + 5y + 7z &= 10 \end{aligned}$$

?|2.
$$\begin{aligned} -15x - 20y + 15z &= 0 \\ 6x + 8y - 6z &= -3 \end{aligned}$$

?|3.
$$\begin{aligned} -15x - 20y + 15z &= 0 \\ 6x + 8y - 6z &= 0 \end{aligned}$$

*Correct Answers:*

- Infinite Solutions
- No Solution
- Infinite Solutions

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**8.** (1 pt) Library/TCNJ/TCNJ_LinearSystems/problem4.pg

Give a geometric description of the following system of equations

?|1.
$$\begin{aligned} 2x + 4y - 6z &= 12 \\ -x + 5y - 9z &= 1 \end{aligned}$$

?|2.
$$\begin{aligned} 2x + 4y - 6z &= 12 \\ -3x - 6y + 9z &= 16 \end{aligned}$$

?|3.
$$\begin{aligned} 2x + 4y - 6z &= -12 \\ -3x - 6y + 9z &= 18 \end{aligned}$$

*Correct Answers:*

- Two planes intersecting in a line
- Two parallel planes
- Two planes that are the same

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**9.** (1 pt) Library/TCNJ/TCNJ_LinearSystems/problem6.pg

Give a geometric description of the following systems of equations

?|1.
$$\begin{aligned} 6x - 9y + 6z &= 3 \\ 10x - 15y + 10z &= 5 \\ 12x - 18y + 12z &= 6 \end{aligned}$$

?|2.
$$\begin{aligned} x + 2y + 8z &= 1 \\ x + 3y + 10z &= 0 \\ 4x + 8y + 28z &= 3 \end{aligned}$$

?|3.
$$\begin{aligned} -5x + 3y - z &= -3 \\ -4x + 2y + z &= 2 \\ 11x - 5y - 5z &= -11 \end{aligned}$$

?|4.
$$\begin{aligned} -5x + 3y - z &= -3 \\ -4x + 2y + z &= 2 \\ 11x - 5y - 5z &= -8 \end{aligned}$$

*Correct Answers:*

- Three identical planes
- Three planes intersecting at a point
- Three planes intersecting in a line
- Three planes with no common intersection

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**10.** (1 pt) Library/TCNJ/TCNJ_LinearSystems/problem17.pg

Determine whether the following system has no solution, an infinite number of solutions or a unique solution.

?|1.
$$\begin{aligned} -3x - y + z &= -5 \\ -4x - 2y + z &= 5 \\ -13x - 7y + 3z &= 22 \end{aligned}$$

?|2.
$$\begin{aligned} 5x + 15y + 21z &= 0 \\ -4x - 13y - 17z &= 8 \\ 2x + 6y + 8z &= 0 \end{aligned}$$

?|3.
$$\begin{aligned} 10x + 2y + 2z &= 6 \\ 25x + 5y + 5z &= 15 \\ -30x - 6y - 6z &= -18 \end{aligned}$$

?|4.
$$\begin{aligned} -3x - y + z &= -5 \\ -4x - 2y + z &= 5 \\ -13x - 7y + 3z &= 25 \end{aligned}$$

*Correct Answers:*

- No Solution
- Unique Solution
- Infinite Solutions
- Infinite Solutions

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**11.** (1 pt) Library/Rochester/setAlgebra35SystemMatrices-/solve_RREF_2.pg

Given the augmented matrix below, solve the associated system of equations. For your variables, use $x1$, $x2$, $x3$, $x4$, $x5$, $x6$, $x7$, and $x8$.

$$\left[\begin{array}{cccccccc|c} 1 & -5 & 1 & -5 & 0 & 7 & -8 & 4 & -9 \\ 0 & 0 & 0 & 0 & 1 & 1 & 1 & -6 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 & 1 & -6 & -5 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & -6 & 9 \end{array}\right]$$

The solution is (_____,_____,_____, _____,_____,_____,_____ _____)

*Correct Answers:*

- -9--5*(x2)-1*(x3)--5*(x4)-0*(0-1*(-5-1*(9--6*(x8))--6*(x8)
- x2
- x3
- x4
- 0-1*(-5-1*(9--6*(x8))--6*(x8))-1*(9--6*(x8))--6*(x8)
- -5-1*(9--6*(x8))--6*(x8)
- 9--6*(x8)
- x8

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**12.** (1 pt) Library/TCNJ/TCNJ_RowReduction/problem10.pg

If the following system has infinitely many solutions,

$$\begin{aligned} 7x - 5y - 4z &= 5 \\ -9x + 2y - 2z &= 7 \\ -11x - y + hz &= k \end{aligned}$$

then $k =$ _____, $h =$ _____

*Correct Answers:*

- 19
- -8

**13.** (1 pt) Library/ma112DB/set11/sw7_3_21.pg
Given the system of equations

$$x+y+z=-2,$$
$$y-3z=-4,$$
$$2x+y+5z=1,$$

(a) determine whether the system is inconsistent or dependent;
Your answer is (input inconsistent or dependent) _____
(b) if your answer is dependent, find the complete solution.
Write $x$ and $y$ as functions of $z$.
$x =$ _____
$y =$ _____

*Correct Answers:*

- `inconsistent`
- 
- 

**14.** (1 pt) Library/TCNJ/TCNJ_RowReduction/problem5.pg
Suppose that the following

$$
\begin{array}{rcrcl}
6x & + & 8y & = & 2 \\
21x & + & 28y & = & k \\
12x & + & 16y & = & 4
\end{array}
$$

is a consistent system. Then $k =$ _____
*Correct Answers:*

- 7

**15.** (1 pt) Library/Utah/College_Algebra/set11_Systems_of_Equations_and_Inequalities
/1050s11p3.pg

The principle that you process the coefficient matrix only
once is so important that we need to practice some more. This
and the next two problems all have the same coefficient matrix.
You want to process it just once, unless you enjoy retracing your
steps.
The solution of the linear system

$$
\begin{array}{rcrcrcrcr}
r & + & s & + & t & + & u & = & -14 \\
r & + & 2s & + & 3t & + & 4u & = & -35 \\
r & - & s & + & 2t & - & u & = & -1 \\
r & + & 2s & - & 3t & + & 2u & = & -17
\end{array}
$$

is
$r =$ _____, $s =$ _____, $t =$ _____, $u =$ _____.
*Correct Answers:*

- -6
- -1
- -1
- -6

**16.** (1 pt) Library/Utah/College_Algebra/set11_Systems_of_Equations_and_Inequaliti
/1050s11p4.pg
The solution of the linear system

$$
\begin{array}{rcrcrcrcr}
r & + & s & + & t & + & u & = & 4 \\
r & + & 2s & + & 3t & + & 4u & = & 13 \\
r & - & s & + & 2t & - & u & = & -15 \\
r & + & 2s & - & 3t & + & 2u & = & 31
\end{array}
$$

is

$r =$ _____, $s =$ _____, $t =$ _____, $u =$ _____.
*Correct Answers:*

- 2
- 1
- -5
- 6

**17.** (1 pt) Library/Utah/College_Algebra/set11_Systems_of_Equations_and_Inequaliti
/1050s11p5.pg

The solution of the linear system

$$
\begin{array}{rcrcrcrcr}
r & + & s & + & t & + & u & = & -1 \\
r & + & 2s & + & 3t & + & 4u & = & -11 \\
r & - & s & + & 2t & - & u & = & -1 \\
r & + & 2s & - & 3t & + & 2u & = & 13
\end{array}
$$

is
$r =$ _____, $s =$ _____, $t =$ _____, $u =$ _____.
*Correct Answers:*

- 5
- -2
- -4
- 0

**18.** (1 pt) Library/WHFreeman/Holt_linear_algebra/Chaps_1-4-
/holt_01_01_003.pg
Determine which of the points $(2,4)$, $(5,5)$, and $(-3,3)$ lie on
both the lines $-x_1 + 3x_2 = 10$ and $-x_1 + 5x_2 = 18$.
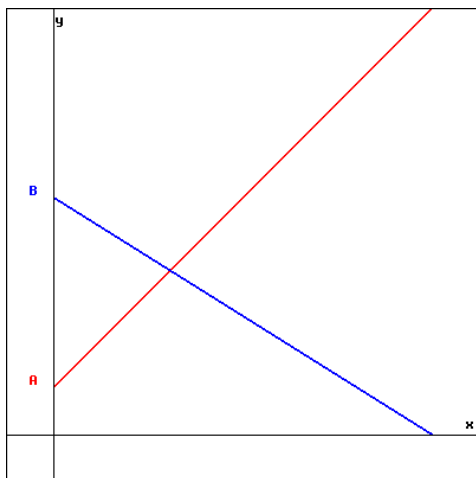
Answer: _____
*Correct Answers:*

- $(2,4)$

**19.** (1 pt) Library/FortLewis/Algebra/5-6-Linear-systems/MCH1-5-6-
22-Linear-systems.pg

Find the point of intersection of the lines in the figure,
given that line $A$, in red, has equation $y = x + 3$ and line
$B$, in blue, has equation $2x + 3y = 12$.

$x =$ _____
$y =$ _____

(Click on graph to enlarge)

*Correct Answers:*

- -3 / -5
- -18 / -5

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**20.** **(1 pt)** **Library/Rochester/setAlgebra35SystemMatrices-/solve_RREF.pg**

Given the augmented matrix below, solve the associated system of equations. For your variables, use $x1$, $x2$, $x3$, $x4$, $x5$, and $x6$.

$$\left[\begin{array}{cccccc|c} 1 & -2 & -4 & 0 & 3 & 5 & -1 \\ 0 & 0 & 1 & -3 & 4 & -3 & -3 \\ 0 & 0 & 0 & 0 & 0 & 1 & -6 \end{array}\right]$$

The solution is (_____,_____,_____,_____,_____,_____)

*Correct Answers:*

- -1--2*(x2)--4*(-3--3*(x4)-4*(x5)--3*(-6))-0*(x4)-3*(x5)-5*(-6)
- x2
- -3--3*(x4)-4*(x5)--3*(-6)
- x4
- x5
- -6
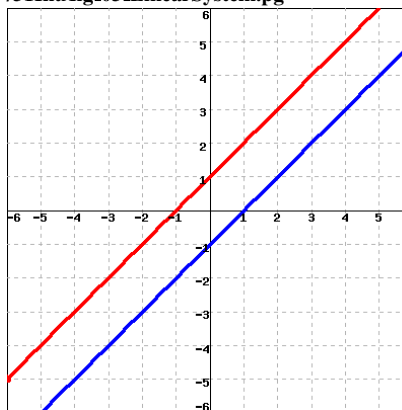
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**21.** **(1 pt) local/Library/UI/holt_01_01_002.pg**

Determine which of the points $(-1,-1,0)$, $(-5,1,-1)$, and $(2,-5,2)$ lie in the plane $x_1 - 3x_2 - 5x_3 = 2$.

Answer: _____

*Correct Answers:*

- (-1,-1,0)

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**22.** **(1 pt) Library/CollegeOfIdaho/setAlgebra_03_01_SystemOfLinearEq-/31IntAlg_03_LinearSystem.pg**



The graphs of two linear equations are shown above. Find the solution.

Answer: _____

*Correct Answers:*

- None

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**23.** **(1 pt) Library/WHFreeman/Holt_linear_algebra/Chaps_1-4-/holt_01_04_028.pg**

Find the values of the coefficients $a$, $b$ and $c$ so that the conditions

$$f(0) = 6, \quad f'(0) = -15, \quad \text{and} \quad f''(0) = -3$$

hold for the function

$$f(x) = ae^x + be^{-2x} + ce^{3x}.$$

$a = $___
$b = $___
$c = $___

*Correct Answers:*

- 4
- 5
- -3

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**24.** **(1 pt) Library/WHFreeman/Holt_linear_algebra/Chaps_1-4-/holt_01_04_022.pg**

When using partial fractions to find antiderivatives in calculus we decompose complicated rational expressions into the sum of simpler expressions that can be integrated individually. The required decomposition is

$$\frac{30}{x(x^2+5)} = \frac{A}{x} + \frac{Bx+C}{x^2+5}$$

Find the values of the missing constants.

$A = $___
$B = $___
$C = $___

*Correct Answers:*

4

- 6
- -6
- 0

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A system of equations can have exactly 1 solution.

- A. True
- B. False

A system of linear equations can have exactly 1 solution.

- A. True
- B. False

A system of linear equations has no solution if and only if there is a pivot column in the echelon form of its augmented matrix.

- A. True
- B. False

A system of linear equations has an infinite number of solutions if and only if its associated augmented matrix has a column corresponding to a free variable.

- A. True
- B. False

If a system of linear equations has an infinite number of solutions, then its associated augmented matrix has a column corresponding to a free variable.

- A. True
- B. False

*Correct Answers:*

- A
- B
- A
- B
- A

**26.** **(1 pt) Library/WHFreeman/Holt_linear_algebra/Chaps_1-4-/2.1.7.pg**

Express the following vector equation as a system of linear equations.

$$x_1 \begin{bmatrix} 4 \\ -3 \end{bmatrix} + x_2 \begin{bmatrix} 2 \\ 6 \end{bmatrix} = \begin{bmatrix} -5 \\ 9 \end{bmatrix}$$

(Keep the equations in order.)

___ $x_1 +$ ___ $x_2 =$ ___.

___ $x_1 +$ ___ $x_2 =$ ___.

*Correct Answers:*

- 4
- 2
- -5
- -3
- 6
- 9