Answer the following questions. You must show your work in order to receive credit.

1. Find the \( y \)-coordinate of the solution to the system of equations \[
\begin{align*}
y &= 2^{x+1} \\
y &= 4^{-x}
\end{align*}
\] (5 pts)
   a. \(-\frac{1}{3}\)
   b. \(\log_2 \frac{1}{3}\)
   c. \(\sqrt[3]{2}\)
   d. \(\sqrt[4]{4}\)
   e. None of the above

2. Find the \( x \)-coordinate of the system of equations \[
\begin{align*}
2x - y &= 5 \\
3x + 2y &= -3
\end{align*}
\] (5 pts)
   a. -4
   b. 1
   c. 3
   d. 4
   e. None of the above

3. Brad spent $9.90 on 20 apples and oranges. The apples cost $0.60 each and the oranges cost $0.25 each. How many oranges did Brad purchase? (5 pts)
   a. 6
   b. 8
   c. 12
   d. 14
   e. None of the above
4. Are the following statements TRUE or FALSE? Circle the correct choice. (3 pts each)

<table>
<thead>
<tr>
<th>The system</th>
<th>TRUE / FALSE</th>
</tr>
</thead>
</table>
| \[
\begin{align*}
    x + y &= 5 \\
    x - y &= 1
\end{align*}
\] is inconsistent | TRUE / FALSE |
| The system | TRUE / FALSE |
| \[
\begin{align*}
    x + y &= 5 \\
    x - y &= 1
\end{align*}
\] is independent | TRUE / FALSE |
| The system | TRUE / FALSE |
| \[
\begin{align*}
    y &= 5 - x \\
    2x + 2y &= 10
\end{align*}
\] is consistent | TRUE / FALSE |
| The system | TRUE / FALSE |
| \[
\begin{align*}
    y &= 5 - x \\
    2x + 2y &= 1
\end{align*}
\] is consistent | TRUE / FALSE |
| \[x\] nickels, \[y\] dimes, and \[z\] quarters are worth \(5x+10y+25z\) dollars. | TRUE / FALSE |
| The line \(y=x\) intersects the circle \(x^2 + y^2 = 1\) twice. | TRUE / FALSE |
| It is impossible to find two real numbers whose sum is 7 and whose product is 1. | TRUE / FALSE |

5. Fill in the blanks so that the two sets are equal: (4 pts)

\[
\{(x, x+3, x-5) \mid x \text{ is any real number}\}
\]

\[
\{(\text{______________}, \text{______________}, z) \mid z \text{ is any real number}\}
\]

6. A fundraising concert will be held at the fairgrounds. Green tickets cost $15, and Blue tickets cost $25. If 2000 tickets are sold, and 300 more Green tickets are sold than Blue tickets, find the total money brought in. (5 pts)

a. $41,500
b. $38,500
c. $1150
d. $3000
e. None of the above
7. Solve the system of equations \( \begin{align*} y &= |x| - 1 \\ 2y - x &= 1 \end{align*} \) (10 pts)

8. The Executive Inn rents a double room for $10 more than a single. One night the motel took in $2159 by renting 15 doubles and 26 singles. What is the rental price of each room? Identify your variables and set up a system of equations, but DO NOT SOLVE THE SYSTEM! (5 pts)
9. One plan for federal income tax reform is to tax an individual's income in excess of $15,000 at a 17% rate. Another plan is to institute a national retail sales tax of 15%. If an individual spends 75% of their income in retail stores where it is taxed at 15%, then for what income level would the tax amount be the same under either plan? (10 pts)

10. Graph the following inequalities: (10 pts each)
   a. $2x - 3y \geq 6$
   b. $y < x^2 + 5x$
11. Graph the solution to the system of inequalities \( \begin{cases} x^2 + y^2 \leq 9 \\ y > 3^x \end{cases} \) (10 pts)