Quiz 9

Show All Work

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1. Solve the following system of equations. (Use any method, but show your work.)

$$\begin{cases} x^2 - 4x - 112y &= 220 \\ x - 4y &= 10 \end{cases}$$

2. Solve the following system of equations. (Use any method, but show your work.)

$$\begin{cases} 5y - 38x &= \text{-}41 \\ x^2 + y &= \text{-}5 \end{cases}$$

3. Solve the following system of equations. (Use any method, but show your work.)

$$\begin{cases} x^3 - 8x - 19y &= 0 \\ 2x^2 + 19y &= 0 \end{cases}$$

4a A vat contains 5625 gallons of brine (salt and water), 55% of which is salt. How much pure water must be boiled off in order to obtain a solution which is 75% salt?

4b A vat contains 5625 gallons of brine (salt and water), 55% of which is salt. How much pure salt must be added in order to obtain a solution which is 75% salt?

5. An experiment in a lab course requires 9,000 milliliters of a 47 percent salt solution. The lab comes equipped with a 15 percent salt solution and a 55 percent salt solution. How much of each should the student mix in order to get the required salt solution?

6. A recent graduate invests $8,000 in two certificates of deposit. The first pays 7% and the second pays 9.5% simple annual interest. If the student's interest after one year is $ 720.00, then how much was invested at each rate?

Answers: 1: (2, -2), (30, 5) ; 2: $(-8, -69), (\frac{2}{5}, -\frac{129}{25})$; 3: $(0, 0), (2, -\frac{8}{19})$ and $(-4, -\frac{32}{19})$; 4a) 1500, b) 4500; 5: 1800, and 7200; 6: $1,600, 6,400$;

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7. Solve the following system of equations. (Use any method, but show your work.)

$$\begin{cases} x^2 - 4x - 64y &= 188 \\ x - 4y &= 14 \end{cases}$$

8. Solve the following system of equations. (Use any method, but show your work.)

$$\begin{cases} 2y - 11x &= 4 \\ x^2 + y &= 5 \end{cases}$$

9. Solve the following system of equations. (Use any method, but show your work.)

$$\begin{cases} x^3 - 20x + 13y &= 0 \\ -x^2 - 13y &= 0 \end{cases}$$

10a A vat contains 4200 gallons of brine (salt and water), 65% of which is salt. How much pure water must be boiled off in order to obtain a solution which is 70% salt?

10b A vat contains 4200 gallons of brine (salt and water), 65% of which is salt. How much pure salt must be added in order to obtain a solution which is 70% salt?

11. An experiment in a lab course requires 4,000 milliliters of a 40 percent salt solution. The lab comes equipped with a 5 percent salt solution and a 55 percent salt solution. How much of each should the student mix in order to get the required salt solution?

12. A recent graduate invests $2,000 in two certificates of deposit. The first pays 6% and the second pays 6.5% simple annual interest. If the student's interest after one year is $ 127.50, then how much was invested at each rate?

Answers: 7: (2, -3), (18, 1) ; 8: $(-6,-31), (\frac{1}{2}, \frac{19}{4})$; 9: $(0,0), (5, -\frac{25}{13})$ and $(-4, -\frac{16}{13})$; 10a) 300, b) 700; 11: 1200, and 2800; 12: $500, 1,500$;