ANSWERS
1. B 2. D 3. C 4. B 5. A 6. B 7. D 8. C 9. B 10. B

Answer Explanations
1. B In this problem, we are given two equations and asked to find ALL of the solutions to the system of equations. Given that these equations are both related through the y-variable we can substitute $2x-3$ for y in the second equation and factor our quadratic equation. $y=x^2-4x+6\rightarrow 2x-3=x^2-4x+6\rightarrow 0=x^2-6x+9\rightarrow (x-3)^2=0$.

Now that we've factored our quadratic equation, we can plug our x-values back into our system of equations to find our y-value solutions. $y=2(-3)-3=-9$. This system of equations has one solution, $(-3,-9)$ which makes answer choice (B) correct.

2. D In this problem, we are given two equations and asked to find ALL of the solutions to the system of equations. Given that these equations are both related through the y-variable we can substitute $x+5$ into our second equation and factor our quadratic equation. $y = x^2 - 3x - 7 \rightarrow x + 5 = x^2 - 3x - 7 \rightarrow 0 = x^2 - 4x - 12 \rightarrow (x-6)(x+2) = 0$. Knowing our x-solutions are 6, -2 we can plug these values into our system of equations to find our y-solutions $(-2,3)$ and $(6,11)$ which makes answer choice (D) correct.

3. C In this problem, we are given two equations and asked to find the value of a knowing (a,b) is a solution and a is greater than zero. Given these equations are both related through the y-variable we can substitute $3x$ into our first equation and factor our quadratic equation.
$-16x^2=(y+4)(y-4)\rightarrow -16x^2=(3x+4)(3x-4)\rightarrow -16x^2=9x^2-16\rightarrow 0=25x^2-16\rightarrow 0=(5x-4)(5x+4)$.
Our a-solutions are $\frac{4}{5},-\frac{4}{5}$, but we are told $a>0$ so the answer is $a=\frac{4}{5}$.

4. B In this problem, we are given two equations and asked to find the number of solutions that satisfy the system of equations. Given these equations are both related through the y-variable we can substitute $7x-13$ into our first equation and factor our equation. $y=x^2-5x+23\rightarrow 7x-13=x^2-5x+23\rightarrow 0=x^2-12x+36\rightarrow (x-6)^2=0$.

Knowing our x-solution is 6, we can only have one solution to the system of equations, which makes answer choice (B) correct.

5. A In this problem, we are given two equations and asked to find the value of x^2. Given these equations are both related through the y-variable we can substitute $-2x$ into our first equation and combine like terms.

$9x^2+2(-2x)^2=136\rightarrow 17x^2=136\rightarrow x^2=8$ which makes answer choice (A) correct.

6. B In this problem, we are given two equations and asked to find a value of x that is greater than zero. Given that these equations are both related through the y-variable we can substitute in $8x^2$ into our first equation and factor our quadratic equation. $8x^2=4-4x\rightarrow 8x^2+4x-4=0\rightarrow 4(2x^2+x-1)=0\rightarrow (2x-1)(x+1)=0\rightarrow x=\frac{1}{2},-1$.

However, we know that $\frac{1}{2}$ is the only solution that is greater than zero. Therefore, the correct answer is (B).

7. D In this problem, we are given two equations and asked to find a value of x that is greater than zero. Given that these equations are both related through the y -variable we can rewrite our second equation as follows:

$\frac{y-2}{6}=8\rightarrow y-2=48\rightarrow y=50$. Then we can substitute

$(x-6)^2+1=50\rightarrow\sqrt{(x-6)^2}=\sqrt{49}\rightarrow x-6=7\rightarrow x=13$. After simplifying our quadratic, we know that our x -solution is 13, which makes answer choice (D) correct.

8. C In this problem, we are given two equations and asked to find the value of b, if (a,b) is the solution to the system of equations. Given that these equations are related through the y -variable, we can substitute $5x-25$ into our second equation and factor our quadratic equation:

$5x-25=x^2-17x+96\rightarrow x^2-22x+121=0\rightarrow(x-11)^2=0$. Now that we've found our x -solution, 11, we can plug this value to find our y -solution. $y=5x-25\rightarrow y=5(11)-25=30$ which makes answer choice (C) correct.

9. B In this problem, we are given two equations and asked to find the product of the y -value of the two solutions. Given that these equations are related through the x -variable we can rewrite our second equation as follows:

$y=\frac{5-x}{3}\rightarrow 3y=5-x\rightarrow x=5-3y$. Now that we have our value of x in terms of y, we can substitute this value in our first equation and simplify our quadratic equation: $6y^2=25(5-3y)-125\rightarrow 6y^2=125-75y-125\rightarrow 6y^2+75y=0\rightarrow y(6y+75)=0$. Now that we know our y -values (0, -12.5), we know the product of any factor times zero is zero. Therefore, the product is zero.

10. B In this problem, we are given two equations and asked to find the y -coordinate of an intersection point. Given that these two equations are related through the y -coordinate we can substitute $7-3x$ into our first equation and simplify our quadratic equation. $7-3x=x^2-x-8\rightarrow x^2+2x-15=0\rightarrow(x-3)(x+5)=0$. Knowing that our x -solutions are 3 and -5, we can plug these values in to find our y -coordinates.

$y=7-3x\rightarrow y=7-3(3)=-2; y=7-3x\rightarrow y=7-3(-5)=22$. Since -2 is an answer choice and 22 isn't, we know the correct answer is B.