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Mathematics Questions for G – 11

I. Choose the best answer from the given alternatives

1. A translation T takes point P(-1, 0) to point Q(1, 3). What is the image of the ellipse $9(x-1)^2+4(y+2)^2=36$ under the translation?
   A. $9(x-3)^2+4(y-1)^2=36$ C. $9(x+1)^2+4y^2=36$
   B. $9(x+3)^2+4(y-1)^2=36$ D. $9(x-2)^2+4(y-1)^2=36$
2. What is the image of the line $2x-y=1$ under the translation that takes $x^2+y^2=1$to $(x-1)^2+(y+1)^2=1$?
   A. $2x-y=2$ B. $2x-y=6$ C. $2x+y=-1$ D. $2x+y=-6$
3. A circle $(x-1)^2+y^2=1$ is first translated by a vector that takes the point (1, 1) to (3, 0) and then reflected in the line y = x. What is the equation of the image of the circle under the two transformations?
   A. $(x-2)^2+(y+1)^2=1$ C. $(x+1)^2+(y-3)^2=1$
   B. $(x-3)^2+(y+1)^2=1$ D. $(x-3)^2+(y-1)^2=1$
4. Let l be the line given b the vector equation $r(x,y)=(4,-2)+t(1,2), t\in R$. Which of the following is an equation of the image of the line l after a reflection in the line $y=2x-5$followed by a rotation through the angle of 90^0 about the origin?
   A. $2x+y=0$ B. $x+2y=5$ C. $x+2y=0$ D. $x-2y=5$
5. The equation of the image of the parabola $y=x^2-1$, after the rotation about the origin through 90^0 in counter clockwise direction is:
   A. $y=x^2-1$ B. $x^2=y-1$ C. $(y+1)^2=-x$ D. $y^2=-x+1$
6. Let M be the reflection about the line $y=x+2$ and R be the rotation about the origin through 90^0. Then what is the value of $M(R(-3,4))$?
   A. $(-5,-2)$ B. $(-2,-5)$ C. $(-4,-3)$ D. $(5,2)$
7. If a translation T takes the point $(-1,3)$ to $(4,2)$, then what is the image of the line $y=2x-3$ under the translation T?
   A. $y=x-7$ C. $x-2y=14$
   B. $-2x+y+14=0$ D. $x-y=7$
8. Let the translation T of the plane takes the origin to the point $(3,-2)$ and another translation S takes the point $(-2,1)$ to the origin. Then which of the following is the image of the circle $x^2+y^2+2x-4y-6=0$ under the translation T followed by S?
   A. $(x+1)^2+(y-4)^2=11$ C. $(x-4)^2+(y+1)^2=11$
   B. $(x-4)^2+(y-1)^2=11$ D. $(x-1)^2+(y+4)^2=11$

II. Workout

9. Find the image of the circle $x^2+y^2=4$ after reflection in the line $L: y=x$.
10. The image of the circle $x^2+y^2-x+2y=0$, when it is reflected about the line L is $x^2+y^2-2x+y=0$. Find the equation of L.
11. Find the image of the line $y=2x+3$ after been reflected about the line $L: y=x-2$.

12. What is the equation of the image a line $y = 3x + 4$ when it is reflected along the line $L: y = 2x - 3$.