



Toy Designer

1. The robot's body should reflect over the y -axis. Write the co-ordinates for the outline of the robot's left side. Start at the top of the head.
2. Use the co-ordinates you found from question 1 to complete the outline of the robot. Use a mirror to check you have been accurate.
3. Half of the robot's mouth is missing. Reflect the part that is there across the y -axis and draw the missing part. What co-ordinates have you used?
4. The co-ordinates for the other eye have been input into the machine incorrectly. The eyes should reflect over the y -axis. Find the mistake.
5. Plot $(7, -7)$ and $(-7, 7)$ on the grid. Draw a straight line between these points. The star badge is reflected over this mirror line. What position is the centre of the reflected badge?
6. Draw a hat for the robot that is an isosceles trapezium shape. Make 2 of the co-ordinates $(5, 7)$, $(4, 8)$ and give the other 2 co-ordinates.
7. The robot needs 4 buttons. The first is at $(5, 1)$. The second button is 2 points down from the first. The third button goes 7 points to the left of the second button and a fourth button up 2 points and 3 to the left of the third button. Draw the buttons and write their co-ordinates.
8. The robot doesn't have a nose! There should be a small square one in the middle of its face but someone input the instructions incorrectly. This is what they put: $(-0.5, -5.5)$, $(-0.5, -4.5)$, $(0.5, -4.5)$, $(0.5, -5.5)$. Describe what they did wrong. Write the correct co-ordinates.
9. Make up a new robot design. Record descriptions and positions of different things in your design so that the Toy Designer can make it accurately.
10. Make a list of useful ideas to help others to reflect a point over a mirror line and to translate points from one place to another. Illustrate your list with diagrams. Your diagrams can be based around the Toy Designer and the robot.