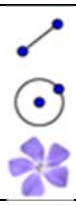
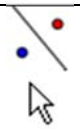
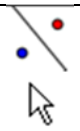
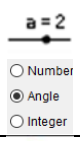
Geogebra Transformations Worksheet 1 – Reflection and Rotation.

1.		Open a new GeoGebra window, showing Graphics view only (you may use the 'Geometry' Perspectives shortcut or use view menu and style bar to hide axes).
2.		Either: Create a Stick Man using Circle and Line Segment tools. Or: Import a pre-saved image (Under the Text Menu Icon).
3.		Draw a mirror line anywhere in the window.
4.		Reflect your object (in step 2) in the mirror line by clicking the reflect button, selecting your object (you will need to select all of your stick man by dragging the 'Move' Arrow over the whole figure) and then the line you drew in step 3.
5.		Try moving the line around (either by grabbing the line or one of the points you created when you drew it) and see what happens to the reflection. Try moving one of the points on the original object and see what happens to the reflected image.
6.		Draw another mirror line anywhere in the window.
7.		Reflect the reflected image (created in step 4) in the new mirror line by clicking the reflect button, selecting your object (you will need to select all of your stick man by dragging the 'Move' Arrow over the whole figure) and then the line you drew in step 6.
8.		Try moving the mirror lines around and see what happens to the reflections. Try moving one of the points on the original object and see what happens to the reflected image. Can you think of a single transformation which will map the object to the double-reflection image?
9.		Hide all Mirror Lines, construction points and the first reflected image so that only the original object and final (double-reflected) image remain. (You may need to display the Algebra window, display the Style Bar and display Auxiliary Objects).
10.		Create a slider α for an angle between 0˚ and 360˚
11.		Rotate original Object around a point by clicking on icon (under reflection menu), clicking to create a point, selecting original object and typing in α for the angle (Alt+A or click on the box on the right hand side in the input box).
12.		Slide Slider and Move rotation point to see whether you can make the image match up with the image created by the double-reflection.
13.		**Extension Activity:** By moving the reflection lines, see if you can always match a rotation to a double-reflection. Can you think of a method to identify the centre of any rotation by using construction tools in Geogebra? (Hint: You may find the perpendicular bisector tool useful). Do the mirror lines help to locate the centre of rotation?
14.		Complete these sentences in your exercise book: Two reflections are the same as a _____ To find the centre of rotation, _____

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