One way of approaching these questions on particle motion is to draw a rough diagram, then choose specific points on the path of motion and then actually measure the distances.

This little program in scratch will do some of the work for us.

It's set up so that the cat does a circle around the x in the middle.

Then at each point, we can calculate the distance between the cat and the apple, and the cat and the baseball.

This pencil is set up to draw a set of axes and then to trace out the distances as the cat moves.

Let's change the position of the baseball so that it's at the centre and see what happens when we run it.

We can see from the graph that the distance to the b stays the same (it's orbiting around the baseball at the same distance) while it moves back and forth in terms of its distance to the apple.

By moving the cat and starting over, we change the radius. Each time, we'll stay the same distance from the baseball, because it's placed at the centre.

If we want to be able to keep track of the actual distances, we can alter the code slightly so that rather than automatically moving, the manual control variable can be used to change the angle.

Now let's see what happens when we change the position of the baseball.

Each position can lead to a slightly different shape being traced on the graph.

Some other things you might want to experiment with are changing it to an elliptical orbit. You can do this by changing the radius multiplier in the cat's code to radius x 2 for either the 'set x to' or 'set y to' blocks.