a)
A cuboidal tank with base 50cm by 20cm is filled to a depth of 10cm with water.
A solid sphere, radius *r*, is dropped into the tank.

The depth of the water rises by 2cm.
What is the radius of the sphere, *r*, correct to two decimal places?

By how much does the water appear to increase in volume?	$50\text{cm} \times 20\text{cm} \times 2\text{cm} = 2000\text{cm}^3$
What is the volume of the sphere?	$\frac{4}{3}\pi r^3 = 2000$
What is the radius of the sphere?	$\pi r^3 = 2000 \div \frac{4}{3} = 1500$ $r^3 = \frac{1500}{\pi}$ $\text{r} = \sqrt[3]{\frac{1500}{\pi}}$ $\text{r} = 7.8159264179677\ldots$ $\text{r} = 7.82\text{cm}$

b)
A cuboidal tank with base 40cm by 30cm is filled to a depth of 12cm with water.
A solid sphere, radius *r*, is dropped into the tank.

The depth of the water is now 16cm.
What is the radius of the sphere, *r*, correct to two decimal places?

By how much does the water appear to increase in volume?	$40\text{cm} \times 30\text{cm} \times 4\text{cm} = 4800\text{cm}^3$
What is the volume of the sphere?	$\frac{4}{3}\pi r^3 = 4800$
What is the radius of the sphere?	

c)
A cylindrical tank with base radius 15cm is filled to a depth of 30cm with water.
A solid sphere, radius *r*, is dropped into the tank.

The depth of the water rises by 4cm.
What is the radius of the sphere, *r*, correct to two decimal places?

By how much does the water appear to increase in volume?	$\pi \times (15\text{cm})^2 \times 4\text{cm} = 900\pi\text{cm}^3$
What is the volume of the sphere?	
What is the radius of the sphere?	

d)
A cylindrical tank with base radius 12cm is filled to a depth of 12cm with water.
A solid sphere, radius *r*, is dropped into the tank.

The depth of the water is now 15cm.
What is the radius of the sphere, *r*, correct to two decimal places?