$KO = 2r$
$= 2x$

3) In right $\triangle KAO$:
Apply Pythagorean Theorem:
$hyp^2 = leg^2 + leg^2$
$KO^2 = AO^2 + KA^2$
$(2x)^2 = x^2 + (3\sqrt{3})^2$
$4x^2 = x^2 + 27$
$3x^2 = 27$
$\sqrt{x^2} = \sqrt{9}$
$\pm x = 3$ cm. Radius = 3cm.
accepted.

2¼

In $\triangle KFA$ we have:
AF = FO (F on perpendicular bisector of [AO] (2). F equidistant from A & O).
But, FO = FK (proved)
So, by comparison: AF = FK.
Thus, $\triangle$ FKA is isosceles at F having 2 equal sides

2¼

4) In $\triangle$FOA: FA = FO = AO = 3cm (proved)
$\triangle$FOA equilateral.
In $\triangle$ MOB: OB = OM = MB = 3cm (equal radii given)
Then by comparison: FA = MB.
Equal chords are held between 2 parallel chords
So, (FM) parallel (AB).
Then, quadrilateral FMBA is isosceles trapezoid having 1 pair of parallel sides and 1 pair equal sides

1½

5) Since G is the centroid of $\triangle$ AMB (given).
So, $OG = \frac{OM}{3}$ (centroid ratios)
$OG = \frac{3}{3}$ (OM = radius = 3cm)
$\boxed{OG = 1cm}$

P-13.