part-B:

1) $a = \dfrac{49^4 + 5\times 7^9}{7^8 \times 9} - 1$

$= \dfrac{7^8 + 5\times 7^9}{7^8\times 9} - 1$

$= \dfrac{7^8(1+5\times 7)}{7^8 \times 9} - 1$

So, $a = \dfrac{1+35}{9} - 1$

$= \dfrac{36}{9} - 1$

$= 4 - 1$

Thus, $\boxed{a = 3}$ which is a multiple of 3.

2a) In $\triangle ABH$ we have:

$H$ is a pt on (s) of diameter $[AB]$ (given)

then, $\hat{AHB} = 90^\circ$ (inscribed angle facing diameter)

but $AB = 6$ cm (given)

& $AH = 3$ cm (proved)

hence $AH = \frac{1}{2} AB$.

Thus, $\triangle ABH$ is semi-equilateral ($90^\circ$ + hyp = 2 smallest side).

Now, $[AH]$ is smallest side of semi-equilateral $\triangle AHB$

So, $\hat{HBA} = 30^\circ$.

hence, $\hat{HAB} = 60^\circ$ (base angles in a right $\triangle$ are complementary)

Thus, mes $\overset{\frown}{HB} = 2\hat{HAB}$ (arc intercepted by an inscribed angle)

$\boxed{\text{mes } \overset{\frown}{HB} = 120^\circ.}$

b) $HB = b = \frac{\sqrt{3}}{2} \times \text{hyp}$ (side facing $60^\circ$)

$= \frac{\sqrt{3}}{2} \times AB$

$= \frac{6\sqrt{3}}{2}$

Thus, $\boxed{b = 3\sqrt{3} \text{ cm}}$

Now, $b = 3\sqrt{3} = \sqrt{3^2 \times 3} = \sqrt{27}$ / Now, $25 < 27 < 36$

Thus, $5 < b < 6$

$b = 5.19615\ldots$

Thus, $\boxed{b \simeq 5.20}$ approximated by excess to nearest $10^{-2}$.