$IB = 2 \times IO$

$IB = 2 \times 4$

$IB = 8cm$

4) a- In Δs GOE & GSB sharing same vertex G

(OE) // (BS) proved

E, G & B And O, G & S are collinear in this order (given)

use Thale's property

Ratios: $\frac{GO}{GS} = \frac{GE}{GB} = \frac{OE}{BS}$

(2) (3)

using ratios 1 & 3

$\frac{GO}{GS} = \frac{OE}{BS}$

$\frac{GO}{GS} = \frac{3}{6}$

$\frac{GO}{GS} = \frac{1}{2}$

In Δs OGJ & OBS sharing same vertex O.

use converse of Thale's Property (if a st line divides 2 sides proportionally then it is parallel to the third side of the Δ).

$\frac{GO}{GS} = \frac{1}{2}$ (proved)

$\frac{IO}{IB} = \frac{1}{2}$ (proved)

Then $\frac{GO}{GS} = \frac{IO}{IB} = \frac{1}{2}$

But G belongs to [OS] & I belongs to [OB] (given)

Thus, (IG) is parallel to (SB)