(ii) Distance downstream:
speed downstream × time

$= 1 \times 20$

$= 20$ m

Q. 2. $\overrightarrow{v_B} = 5\vec{i} + 12\vec{j}$

$$\text{Time across} = \frac{\text{distance across}}{\text{speed across}}$$

$$= \frac{60}{12}$$

$= 5$ s

Distance downstream:
speed downstream × time

$= 5 \times 5$

$= 25$ m

Q. 3. (i) Puts all effort into going across:

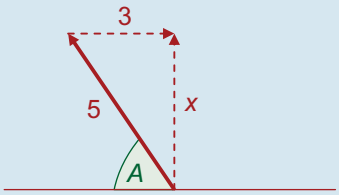
$\Rightarrow \overrightarrow{v_B} = 3\vec{i} + 5\vec{j}$

$$\text{Time across} = \frac{\text{distance across}}{\text{speed across}}$$

$$= \frac{60}{5}$$

$= 12$ s

(ii) Heads upstream at an angle A to the bank at full speed, 5 m/s.



$x^2 + 3^2 = 5^2$

$\Rightarrow x = 4$

$\Rightarrow$ Boat travels at 4 m/s straight across.

$$\text{Time across} = \frac{\text{distance across}}{\text{speed across}}$$

$$= \frac{60}{4}$$

$= 15$ s

Q. 4. (i) Puts all effort into going across:

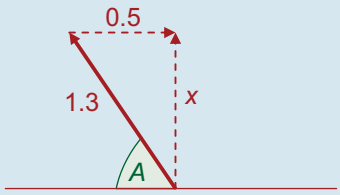
$\Rightarrow \overrightarrow{v_B} = 0.5\vec{i} + 1.3\vec{j}$

$$\text{Time across} = \frac{\text{distance across}}{\text{speed across}}$$

$$= \frac{39}{1.3}$$

$= 30$ s

(ii) Heads upstream at an angle A to the bank at full speed, 1.3 m/s.



$x^2 + 0.5^2 = 1.3^2$

$\Rightarrow x = 1.2$

$\Rightarrow$ Boat travels at 1.2 m/s straight across.

$$\text{Time across} = \frac{\text{distance across}}{\text{speed across}}$$

$$= \frac{39}{1.2}$$

$= 32.5$ s

Q. 5. (i) Puts all effort into going across:

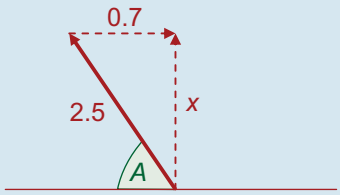
$\Rightarrow \overrightarrow{v_B} = 0.7\vec{i} + 2.5\vec{j}$

$$\text{Time across} = \frac{\text{distance across}}{\text{speed across}}$$

$$= \frac{60}{2.5}$$

$= 24$ s

(ii) Heads upstream at an angle A to the bank at full speed, 2.5 m/s.



$x^2 + 0.7^2 = 2.5^2$

$\Rightarrow x = 2.4$

$\Rightarrow$ Boat travels at 2.4 m/s straight across.

$$\text{Time across} = \frac{\text{distance across}}{\text{speed across}}$$

$$= \frac{60}{2.4}$$

$= 25$ s

Q. 6. (i) Puts all effort into going across:

$\Rightarrow \overrightarrow{v_B} = 0.8\vec{i} + 1.7\vec{j}$

$$\text{Time across} = \frac{\text{distance across}}{\text{speed across}}$$

$$= \frac{510}{1.7}$$

$= 300$ s