(a) $\angle PRQ = 180° - 56° - 74° = 50°$

$$\frac{PQ}{\sin 50°} = \frac{30}{\sin 74°}$$

$$PQ \approx 23.9\,\text{cm}$$

(b) (i) Let S be a point on PQ such that $TS \perp PQ$.

Required angle is $\angle TSV$.

In $\triangle PRT$, $\angle TPR = \dfrac{56°}{2} = 28°$, $\angle TRP = \dfrac{50°}{2} = 25°$ and $\angle PTR = 180° - 28° - 25° = 127°$.

$$\frac{RT}{\sin 28°} = \frac{30}{\sin 127°} \quad \text{and} \quad \frac{PT}{\sin 25°} = \frac{30}{\sin 127°}$$

$$RT \approx 17.6\,\text{cm} \qquad PT \approx 15.9\,\text{cm}$$

Note that $\angle VRT = 40°$.

$VT = RT \tan 40° \approx 14.8\,\text{cm}$

$TS = PT \sin 28° \approx 7.45\,\text{cm}$

Consider $\triangle TSV$.

$$\tan \angle TSV = \frac{VT}{TS}$$

$$\angle TSV \approx 63.3°$$

(ii) Let U be a point on PQ such that $TU \perp PQ$.

Required angle is $\angle TUV$.

Since T is the circumcentre of $\triangle PQR$, we have $\angle PTR = 2\angle PQR = 148°$.

$$\sin \frac{148°}{2} = \frac{\left(\frac{30}{2}\right)}{RT}$$

$$RT \approx 15.6\,\text{cm}$$

$VT = RT \tan 40° \approx 13.1\,\text{cm}$

Note that U is the mid-point of PQ.

$\angle PTU = \dfrac{1}{2}\angle PTQ = \dfrac{1}{2}(2\angle PRQ) = 50°$

$PT = RT \approx 15.6\,\text{cm}$

$TU = PT \cos 50° \approx 10.0\,\text{cm}$

Consider $\triangle TUV$.

$$\tan \angle TUV = \frac{VT}{TU}$$

$$\angle TUV \approx 52.5°$$

(iii) Let W be a point on PQ such that $TW \perp PQ$.

Required angle is $\angle TWV$.

$\angle TPQ = 180° - 90° - 74° = 16°$

$\angle TPR = 56° - 16° = 40°$

$\angle PRW = 180° - 90° - 56° = 34°$

$\angle TRQ = 50° - 34° = 16°$

$\angle PTR = 180° - 34° - 40° = 106°$

Consider $\triangle PTR$.

$$\frac{RT}{\sin 40^\circ} = \frac{30}{\sin 106^\circ}$$

$$RT \approx 20.1 \text{ cm}$$

$VT = RT \tan 40^\circ \approx 16.8 \text{ cm}$

$TW = RW - RT$

$= 30 \sin 56^\circ - RT$

$\approx 4.81 \text{ cm}$

Consider $\triangle TWV$.

$$\tan \angle TWV = \frac{VT}{TW}$$

$$\angle TWV \approx 74.1^\circ$$

END OF PAPER