Trigonometric Ratios Ex 5.3 Q1

Answer :

(i) Given that $\frac{\sin 20}{\cos 70}$

Since $\sin(90-\theta)=\cos\theta$

$$\Rightarrow \frac{\sin 20}{\cos 70}=\frac{\sin(90-70)}{\cos 70}$$

$$\Rightarrow \frac{\sin 20}{\cos 70}=\frac{\cos 70}{\cos 70}$$

$$\Rightarrow \frac{\sin 20}{\cos 70}=1$$

Therefore $\frac{\sin 20}{\cos 70}=\boxed{1}$

(ii) Given that $\frac{\cos 19}{\sin 71}$

$$\Rightarrow \frac{\cos 19}{\sin 71}=\frac{\cos(90-71)}{\sin 71}$$

$$\Rightarrow \frac{\cos 19}{\sin 71}=\frac{\sin 71}{\sin 71}$$

$$\Rightarrow \frac{\cos 19}{\sin 71} = 1$$

Since $\cos(90-\theta) = \sin\theta$

Therefore $\frac{\cos 19}{\sin 71} = \boxed{1}$

(iii) Given that $\frac{\sin 21}{\cos 69}$

Since $\sin(90-\theta) = \cos\theta$

$$\Rightarrow \frac{\sin 21}{\cos 69} = \frac{\sin(90-69)}{\cos 69}$$

$$\Rightarrow \frac{\sin 21}{\cos 69} = \frac{\cos 69}{\cos 69}$$

$$\Rightarrow \frac{\sin 21}{\cos 69} = \boxed{1}$$

(iv) We are given that $\frac{\tan 10}{\cot 80}$

Since $\tan(90-\theta) = \cot\theta$

$$\Rightarrow \frac{\tan 10}{\cot 80} = \frac{\tan(90-80)}{\cot 80}$$

$$\Rightarrow \frac{\tan 10}{\cot 80} = \frac{\cot 80}{\cot 80}$$

$$\Rightarrow \frac{\tan 10}{\cot 80} = 1$$

Therefore $\frac{\tan 10}{\cot 80} = \boxed{1}$

(v) Given that $\frac{\sec 11}{\cos ec 79}$

Since $\sec(90-\theta) = \operatorname{cosec}\theta$

$$\Rightarrow \frac{\sec 11}{\operatorname{cosec} 79} = \frac{\sec(90-79)}{\operatorname{cosec} 79}$$

$$\Rightarrow \frac{\sec 11}{\operatorname{cosec} 79} = \frac{\operatorname{cosec} 79}{\operatorname{cosec} 79}$$

$$\Rightarrow \frac{\sec 11}{\operatorname{cosec} 79} = 1$$

Therefore $\frac{\sec 11}{\operatorname{cosec} 79} = \boxed{1}$

********** END **********