Exercise 3 – Negative Angles

1) $$\frac{2\sin(180^\circ - x).\cos(-x)}{\sin(-180^\circ - x).\cos(x - 180^\circ)}$$

$$= \frac{2\sin x.\cos(360^\circ - x)}{\sin(180^\circ - x).\cos(180^\circ + x)}$$

$$= \frac{2\sin x.\cos x}{\sin x.(-\cos x)}$$

$$= -2$$

2) $$\frac{\sin(180^\circ + x).\cos(-x)}{\tan(-x)} + \sin(x - 360^\circ).\sin(x - 180^\circ)$$

$$= \frac{-\sin x.\cos(360^\circ - x)}{\tan(360^\circ - x)} + \sin x.\sin(180^\circ + x)$$

$$= \frac{-\sin x.\cos x}{-\tan x} + \sin x.(-\sin x)$$

$$= \frac{-\sin x.\cos x}{-\tan x} + (-\sin^2 x)$$

LCD: $\tan x$

$$= \frac{\sin x.\cos x - \sin^2 x.\tan x}{\tan x}$$

$$= \frac{\sin x(\cos x - \sin x \tan x)}{\tan x}$$

(*) Identities

3) $1 - \dfrac{\sin^2(180^\circ + x)}{\cos(x - 180^\circ) \cdot \cos(x - 360^\circ)}$

$= 1 - \dfrac{\sin^2 x}{\cos(180^\circ + x) \cdot \cos x}$

$= 1 - \dfrac{\sin^2 x}{-\cos x \cdot \cos x}$

$= 1 - \dfrac{\sin^2 x}{-\cos^2 x}$

$= 1 + \dfrac{\sin^2 x}{\cos^2 x}$

(*) Identities

$= \dfrac{\cos^2 x + \sin^2 x}{\cos^2 x} \longrightarrow$

4) $\dfrac{1 + \sin(-x)}{\cos^2(x - 180^\circ)}$

$= \dfrac{1 + \sin(360^\circ - x)}{\cos^2(180^\circ + x)}$

$= \dfrac{1 - \sin x}{\cos^2 x} \longrightarrow$

5) $$\frac{\tan(x-180^\circ) + \sin(180^\circ+x).\cos(-x)}{\sin^2(360^\circ-x)}$$

$$= \frac{\tan(180^\circ+x) + (-\sin x).\cos(360^\circ-x)}{\sin^2 x}$$

$$= \frac{\tan x - \sin x.\cos x}{\sin^2 x}$$ → (xx) Identities