18. Cont.

b.

$$= \frac{-4\cancel{tg x}}{(1-tg^2x)\cancel{tg x}} = \frac{-4}{1-tg^2x}$$

$\therefore$

$$\boxed{\frac{tg\left(\frac{\pi}{4}-x\right) - tg\left(\frac{\pi}{4}+x\right)}{tg\, x} = \frac{4}{tg^2x-1}}$$

c.

$$\cos 4x + \cos 3x =$$
$$= 2\cos\frac{4x+3x}{2}\cos\frac{4x-3x}{2}$$
$$= 2\cos\frac{7x}{2}\cos\frac{x}{2}$$

$$\sin 4x - \sin 3x =$$
$$= 2\cos\frac{4x+3x}{2}\sin\frac{4x-3x}{2}$$
$$= 2\cos\frac{7x}{2}\sin\frac{x}{2}$$

$\therefore$

$$\frac{\cos 4x + \cos 3x}{\sin 4x - \sin 3x} = \frac{\cancel{2\cos\frac{7x}{2}}\cos\frac{x}{2}}{\cancel{2\cos\frac{7x}{2}}\sin\frac{x}{2}}$$

$$= \cot\frac{x}{2}$$

19.

$$\begin{cases} \sin x = \dfrac{-1}{3}, & \pi < x < \dfrac{3\pi}{2} \\ \cos y = \dfrac{2}{5}, & \dfrac{3\pi}{2} < y < 2\pi \end{cases}$$

$$\sec(x-y) = \frac{1}{\cos(x-y)}$$

Mas

$$\cos(x-y) = \cos x \cos y + \sin x \sin y$$

Mas

$$\pi < x < \frac{3\pi}{2} \Rightarrow \cos x < 0$$

$$\therefore \cos x = -\sqrt{1-\sin^2 x}$$
$$= -\sqrt{1-\frac{1}{9}}$$
$$\left\|\cos x = \frac{-2\sqrt{2}}{3}\right\|$$

$$\frac{3\pi}{2} < y < 2\pi \Rightarrow \sin y < 0$$

$$\sin y = -\sqrt{1-\cos^2 y}$$
$$= -\sqrt{1-\frac{4}{25}}$$
$$\left\|\sin y = -\frac{\sqrt{21}}{5}\right\|$$

$\therefore$

$$\cos(x-y) = -\frac{2\sqrt{2}}{3}\,\frac{2}{5} + \frac{-1}{3}\,\frac{-\sqrt{21}}{5}$$
$$= \frac{-4\sqrt{2}}{15} + \frac{\sqrt{21}}{15} = \frac{\sqrt{21}-4\sqrt{2}}{15}$$

$$\boxed{\sec(x-y) = \frac{15}{\sqrt{21}-4\sqrt{2}}}$$