

16. Cont.

$$\begin{aligned} \sin x + \sin y &= \textcircled{*} + \textcircled{**} \\ &= 2 \sin \frac{x+y}{2} \cos \frac{x-y}{2} // \end{aligned}$$

$$\begin{aligned} \sin x - \sin y &= \textcircled{*} - \textcircled{**} \\ &= 2 \sin \frac{x-y}{2} \cos \frac{x+y}{2} // \end{aligned}$$

c, d)

$$\begin{aligned} \cos x &= \cos \left(\frac{x+y}{2} + \frac{x-y}{2} \right) \\ &= \cos \frac{x+y}{2} \cos \frac{x-y}{2} - \sin \frac{x+y}{2} \sin \frac{x-y}{2} \end{aligned}$$

$$\begin{aligned} \cos y &= \cos \left(\frac{x+y}{2} - \frac{x-y}{2} \right) \\ &= \cos \frac{x+y}{2} \cos \frac{x-y}{2} + \sin \frac{x+y}{2} \sin \frac{x-y}{2} \end{aligned}$$

$$\begin{aligned} \cos x + \cos y &= \textcircled{***} + \textcircled{****} \\ &= 2 \cos \frac{x+y}{2} \cos \frac{x-y}{2} \end{aligned}$$

$$\begin{aligned} \cos x - \cos y &= \textcircled{***} - \textcircled{****} \\ &= -2 \sin \frac{x+y}{2} \sin \frac{x-y}{2} \end{aligned}$$

17.

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$$\begin{aligned} \text{a) } \sin 60^\circ + \sin 20^\circ &= \\ &= 2 \cos \frac{60^\circ+20^\circ}{2} \sin \frac{60^\circ-20^\circ}{2} \\ &= 2 \cos 20^\circ \sin 40^\circ // \end{aligned}$$

$$\begin{aligned} \text{b) } \cos 70^\circ - \cos 110^\circ &= \\ &= -2 \sin \frac{70^\circ+110^\circ}{2} \sin \frac{70^\circ-110^\circ}{2} \\ &= -2 \sin 90^\circ \sin (-20^\circ) \\ &= -2 (-\sin 20^\circ) \\ &= 2 \sin 20^\circ // \end{aligned}$$

$$\begin{aligned} \text{c) } \cos 40^\circ + \cos 80^\circ &= \\ &= 2 \cos \frac{40^\circ+80^\circ}{2} \cos \frac{40^\circ-80^\circ}{2} \\ &= 2 \cos 60^\circ \cos (-20^\circ) \\ &= 2 \cdot \frac{1}{2} \cos 20^\circ \\ &= \cos 20^\circ // \end{aligned}$$

$$\begin{aligned} \text{d) } \sin 6x - \sin 2x &= \\ &= 2 \cos \frac{6x+2x}{2} \sin \frac{6x-2x}{2} \\ &= 2 \cos 4x \sin 2x \end{aligned}$$