Bestimmen Sie alle Winkel x für die gilt:

a) $\sin(3x+15°) = -0.5$ b) $2\cos(x-60°) = -1$ c) $\tan(4x) = \sqrt{3}$

d) $2\sin(x+15°) = -\sqrt{2}$ e) $2\cos(3x-60°) = 1$ f) $2\sin(0.3x+45°) = -\sqrt{3}$

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a) $\sin(3x+15°) = -0.5$

$3x+15° = -30° + k\cdot 360°$ oder $3x+15° = 210° + k\cdot 360°$

$= 330° + k\cdot 360°$ $3x = 195° + k\cdot 360°$

$3x = 315° + k\cdot 360°$ $\mathbf{x = 65° + k\cdot 120°}$

$\mathbf{x = 105° + k\cdot 120°}$

Das sind im Bereich [0°;360°] 6 Winkel! (65°, 105°, 185°, 225°, 305°, 345°)

b) $2\cos(x-60°) = -1$

$\cos(x-60°) = \frac{-1}{2}$

$x-60° = 120° + k\cdot 360°$ oder $x-60° = 240° + k\cdot 360°$

$\mathbf{x = 180° + k\cdot 360°}$ $\mathbf{x = 300° + k\cdot 360°}$

c) $\tan 4x = \sqrt{3}$

$4x = 60° + k\cdot 180° \quad | : 4$

$\mathbf{x = 15° + k\cdot 45°}$

d) $2\sin(x+15°) = -\sqrt{2}$

$\sin(x+15°) = \frac{-\sqrt{2}}{2}$

$x+15° = 225° + k\cdot 360°$ oder $x+15° = 315° + k\cdot 360°$

$\mathbf{x = 210° + k\cdot 360°}$ $\mathbf{x = 300° + k\cdot 360°}$

e) $2\cos(3x - 60°) = 1$

$\cos(3x - 60°) = 0.5$

$3x - 60° = 60° + k \cdot 360°$ oder $3x - 60° = 300° + k \cdot 360°$

$3x = 120° + k \cdot 360°$ $3x = 360° + k \cdot 360°$

$\mathbf{x = 40° + k \cdot 120°}$ $3x = 0° + k \cdot 360°$

$\mathbf{x = k \cdot 120°}$

f) $2\sin(0.3x + 45°) = -\sqrt{3}$

$\sin(0.3x + 45°) = -\frac{\sqrt{3}}{2}$

$0.3x + 45° = 240° + k \cdot 360°$ oder $0.3x + 45° = 300° + k \cdot 360°$

$0.3x = 195° + k \cdot 360°$ $0.3x = 255° + k \cdot 360°$

$\mathbf{x = 650° + k \cdot 1200°}$ $\mathbf{x = 850° + k \cdot 1200°}$