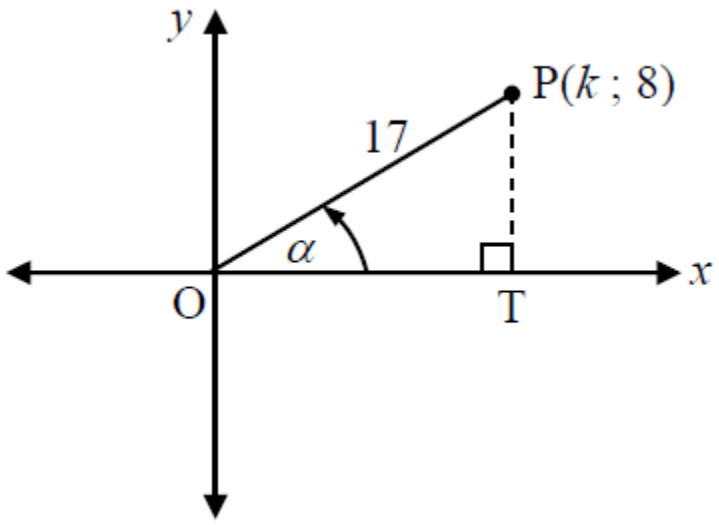
1. Simplify the following expressions:
   a) $\dfrac{\sin(315°)\cos(-315°)\sin(210°)}{\tan(225°)}$
   b) $\dfrac{8\cos^2 35° - 8\sin^2 35°}{2\sin 20°}$
2. Prove the following trig identities. You may ignore all restrictions
   a) $\dfrac{\sin^3 x + \sin x \cos^2 x}{\cos x} = \tan x$
   b) $\cos^4 x - \sin^4 x = 2\cos^2 x - 1$
   c) $\dfrac{\sin 2x - \sin x}{\cos 2x + \cos x} = \dfrac{\sin x}{\cos x + 1}$
3. Use the compound angle formulas to write each of the following as a single term
   $\sin 3\vartheta \cos\vartheta - \cos 3\vartheta \sin\vartheta$
4. Evaluate the following without the use of a calculator
   a) $\cos 105°$
   b) $\cos 230° \cos 160° + \sin 310° \sin 200°$
   c) $\cos^2 15° - \sin^2 15°$
   d) $1 - 2\sin^2 22{,}5°$
5. Given that $\tan\vartheta = \dfrac{\sin 2\vartheta}{1 + \cos 2\vartheta}$
   a) Prove the above identity.
   b) Hence, determine the value of $\tan 22{,}5°$ without the use of a calculator.
6. The point P(k;8) lies in the first quadrant such that OP = 17 units and TŐP = α as shown in the diagram below



a) Determine the value of k.
b) Write down the value of cos α.
c) If it is further given that α + β = 180°, determine, cos β
d) Hence, determine the value of sin(β-α)

7. Answer the following question

a) Prove $8\cos^4 x - 8\cos^2 x + 1 = \cos 4x$

b) Hence solve $8\cos^4 x - 8\cos^2 x + 1 = 0{,}8$

c) Express the following in terms of t, given $t = \sin \vartheta$

$$\frac{\cos(\vartheta - 90°)\cos(720° + \vartheta)\tan(\vartheta - 360°)}{\sin^2(\vartheta + 360°)\cos(\vartheta + 90°)}$$

8. Answer the following question

a) Prove that $\frac{1 - \cos 2x - \sin x}{\sin 2x - \cos x} = \tan x$

b) The above expression is undefined if $\sin 2x - \cos x = 0$. Solve this equation in the interval $0° \le x \le 360°$