1. Tear off the top page of the exam and consider the four graphs (labelled (a) to (d)) depicted there. For each of these, write down a function which has the given graph.

(a) 

(b) 

(c) 

(d)
2. Let $t$ be a fourth-quadrant angle: $\frac{3\pi}{2} < t < 2\pi$. Given that $\tan t = -\frac{3}{2}$, find the exact values of $\sin t$ and $\cos t$.

3. Prove the identity:

$$\frac{\cos \alpha}{\cos \alpha - \sin \alpha} = \frac{1}{1 - \tan \alpha}.$$

(Hint: Three or four steps should suffice.)
4. Prove the identity:

\[
\frac{\cos x}{\csc x - \sin x} = \tan x
\]

(Hint: Five or six steps should suffice.)

5. Find the exact value of \(\sin \left( -\frac{11\pi}{12} \right) \).
(12) 6. Find $\tan(x + y)$ if

$$\sin x = \frac{1}{2}, \quad 0 < x < \frac{\pi}{2}$$

$$\cos y = -\frac{3}{5}, \quad \pi < x < \frac{3\pi}{2}$$

(12) 7. Express $\sqrt{3} \sin x - \cos x$ in the form $c \sin(x + D)$. 
(10) 8. Use \( \tan^{-1} \) to find the smallest positive angle between the lines \( y = x + 1 \) and \( y - 2x = 3 \).

(6) 9. Make the substitution \( t = 2 \sec x \) (with \( 0 < x < \frac{\pi}{2} \)), and simplify the expression \( \sqrt{t^2 + 4} \).