MAS115 Calculus I 2007-2008

Problem sheet for exercise class 2

- **Make sure you attend the excercise class that you have been assigned to!**
- The instructor will present the starred problems in class.
- You should then work on the other problems on your own.
- The instructor and helper will be available for questions.
- Solutions will be available online by Friday.

Problem 1: Evaluate in terms of radicals

(*) (i) $\sin \frac{7\pi}{12}$

(ii) $\cos \frac{\pi}{12}$ [2007 exam questions]

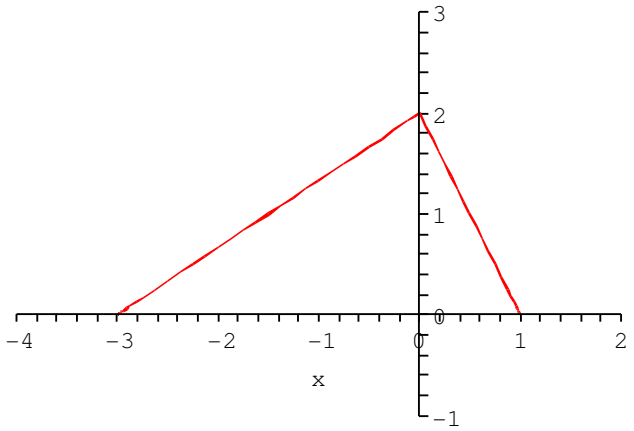
Problem 2: Find a formula for $f \circ g$ and $g \circ f$ and find the domain and range of each.

$$(a) \qquad f(x) = 2 - x^2\,, \qquad g(x) = \sqrt{x+2}$$
$$(b) \qquad f(x) = \sqrt{x}\,, \qquad g(x) = \sqrt{1-x}$$

Problem 3: Prove the identity

$$\frac{1-\cos x}{\sin x} = \frac{\sin x}{1+\cos x}$$

Problem 4: The graph of f is shown. Draw the graph of each function.
(a) $y = f(-x)$, (b) $y = -f(x)$, (c) $y = -2f(x+1)+1$, (d) $y = 3f(x-2)-2$.



Extra: Graph the equations (a) $|x| + |y| = 1 + x$ and (b) $y + |y| = x + |x|$.

Thomas Prellberg, October 2007