

ANSWER KEY TO HOMEWORK SHEET 7
Limits and continuous functions

NOTE: this answer key contains only the correct answers. To get full credit for your solutions, you also need to show the procedure you used to arrive at the correct answer, unless explicitly stated in the exercise.

Exercise 1 (14 points).

(a) $-\frac{\pi}{2}$.

(b) $+\infty$.

(c) $+\infty$.

(d) $+\infty$.

(e) 0.

(f) $-\frac{\pi}{2}$.

(g) $+\infty$.

Exercise 2 (15 points).

(a) 0.

(b) 1.

(c) 0.

(d) 0.

(e) $\cos(x)$.

Exercise 3 (7 points). Use the Intermediate Value Theorem and remark that the function is continuous. E.g. $f(0) > 0$, $f(\frac{\pi}{2}) < 0$.

Exercise 4 (12 points). Draw the picture.

Exercise 5 (12 points).

$$\begin{array}{ll} f(-8) = \frac{15}{16}, & f(-\frac{1}{2}) = 0. \\ \lim_{x \rightarrow -\infty} f(x) = 1, & \lim_{x \rightarrow +\infty} f(x) = 1. \\ \lim_{x \rightarrow -2^-} f(x) = +\infty, & \lim_{x \rightarrow -2^+} f(x) = -\infty. \\ \lim_{x \rightarrow 2^-} f(x) = -\infty, & \lim_{x \rightarrow 2^+} f(x) = +\infty. \end{array}$$