

ANSWER KEY TO HOMEWORK SHEET 5
Trigonometric Equations and Limits

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 (18 points).

- (a) $\frac{5\pi}{4}, \frac{7\pi}{4}, \frac{13\pi}{4}, \frac{15\pi}{4}$.
- (b) $\pm\frac{\pi}{6}, \pm\frac{11\pi}{6}$.
- (c) $x = \frac{2\pi}{3}, \frac{5\pi}{3}$.
- (d) $-\frac{\pi}{6}, \frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}$.
- (e) $-\frac{3\pi}{4}, -\frac{\pi}{4}, \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}, \frac{9\pi}{4}, \frac{11\pi}{4}$.
- (f) $-\frac{\pi}{3}, \frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}, \frac{7\pi}{3}, \frac{8\pi}{3}, \frac{10\pi}{3}$.

Exercise 2 (24 points).

- (a) $-\frac{4\pi}{3}, -\frac{2\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}$.
- (b) $\frac{\pi}{2}, \frac{7\pi}{6}, \frac{11\pi}{6}, \frac{5\pi}{2}, \frac{19\pi}{6}, \frac{23\pi}{6}$.
- (c) $-\frac{7\pi}{3}, -\frac{5\pi}{3}, -\frac{\pi}{3}, \frac{\pi}{3}$.
- (d) $\pm \arctan 2, \pm(\pi - \arctan 2), \pm \arctan 3, \pm(\pi - \arctan 3)$.
- (e) $0, \frac{3\pi}{4}, \pi, \frac{7\pi}{4}, 2\pi, \frac{11\pi}{4}, 3\pi, \frac{15\pi}{4}, 4\pi$.
- (f) $-\frac{5\pi}{6}, -\frac{\pi}{6}, \frac{\pi}{2}, \frac{7\pi}{6}, \frac{11\pi}{6}, \frac{5\pi}{2}$.
- (g) no solutions.
- (h) $\pm\frac{\pi}{3}, \pm\pi, \pm\frac{5\pi}{3}$.

Exercise 3 (18 points). Details may vary, but the relevant features must be visible in the picture.

