

Practise, Apply, Solve 5.8, page 474

1. (a) $\frac{\pi}{2}$ (b) $\frac{3\pi}{2}$ (c) $\frac{\pi}{6}, \frac{5\pi}{6}$ (d) $\frac{7\pi}{6}, \frac{11\pi}{6}$
2. (a) 0, 2π (b) π (c) $\frac{\pi}{3}, \frac{5\pi}{3}$ (d) $\frac{2\pi}{3}, \frac{4\pi}{3}$
3. (a) two possible solutions
(b) quadrants I and II (c) 60° (d) $60^\circ, 120^\circ$
4. (a) two possible solutions
(b) quadrants II and III (c) 30° (d) $150^\circ, 210^\circ$
5. (a) two possible solutions
(b) quadrants I and III (c) 1.22 (d) $1.22, 4.36$
6. (a) $40.5^\circ, 139.5^\circ$ (b) $36.9^\circ, 323.1^\circ$ (c) $56.3^\circ, 236.3^\circ$
(d) $8.6^\circ, 171.4^\circ$ (e) $36.9^\circ, 323.1^\circ$ (f) $130.9^\circ, 229.1^\circ$
7. (a) 0.44, 2.70 (b) 1.41, 4.87 (c) 1.17, 4.31
(d) 3.67, 5.76 (e) 2.58, 5.72 (f) 2.43, 3.85
8. (a) $45^\circ, 225^\circ$ (b) $45^\circ, 135^\circ$ (c) $30^\circ, 330^\circ$
(d) $240^\circ, 300^\circ$ (e) $135^\circ, 225^\circ$ (f) $60^\circ, 240^\circ$
9. (a) $210.0^\circ, 330.0^\circ$ (b) $132.8^\circ, 228.2^\circ$ (c) $56.3^\circ, 236.3^\circ$
(d) $221.8^\circ, 318.2^\circ$ (e) $78.5^\circ, 281.5^\circ$ (f) $116.6^\circ, 296.6^\circ$
10. (a) There are two solutions unless the solution is at a minimum.
(b) $53.1^\circ, 306.9^\circ$
11. (a) 0.52, 2.62 (b) 0.52, 5.76
(c) 1.05, 5.24 (d) 3.67, 5.76
12. (a) 0.4, 1.2, 3.5, 4.3
(b) 0.13, 1.70, 3.27, 4.84, 0.65, 2.23, 3.80, 5.37
(c) 1.40, 3.49, 5.59, 1.75, 3.84, 5.93
(d) 0.59, 2.16, 3.73, 5.30, 0.98, 2.55, 4.12, 5.69
(e) 1.05, 2.09, 4.19, 5.23
(f) 1.05
13. min. $\left(\frac{3\pi}{4}, -1\right)$ and $\left(\frac{7\pi}{4}, -1\right)$, max. $\left(\frac{\pi}{4}, 1\right)$ and $\left(\frac{5\pi}{4}, 1\right)$, zeros
 $0, \frac{\pi}{2}, \pi, \frac{3\pi}{2}, 2\pi$, solutions are 1.96, 5.11, 2.75, 5.89
14. Answers will vary.
15. (a) 8 m (b) 15 m (c) 6 s
(d) 1 m (e) 18 s (f) 48 s
16. (a) 25 cm
(b) $10.6^\circ, 61.4^\circ, 82.6^\circ, 133.4^\circ, 154.6^\circ, 205.4^\circ, 226.6^\circ, 277.4^\circ,$
 $298.6^\circ, 349.4^\circ$
(c) $28.6^\circ, 43.4^\circ, 100.6^\circ, 115.4^\circ, 172.6^\circ, 187.4^\circ, 244.6^\circ, 259.4^\circ,$
 $316.6^\circ, 331.4^\circ$
(d) 15 s
17. (a) $194.5^\circ, 345.5^\circ$ (b) $78.5^\circ, 281.5^\circ$
(c) $66.8^\circ, 246.8^\circ$
(d) $105.0^\circ, 165.0^\circ, 285.0^\circ, 345.0^\circ$
(e) $60.0^\circ, 180.0^\circ, 300.0^\circ$ (f) 22.6°
(g) $60.0^\circ, 300.0^\circ$ (h) 60.0°
18. (a) 3.48, 5.94 (b) 6.28
(c) 0.23, 1.80, 3.37, 4.94,
(d) 1.22, 1.92, 3.32, 4.01, 5.41, 6.11
(e) 2.09, 4.19 (f) 1.77, 4.91
(g) 4.71 (h) 0.32, 3.97
19. (a) 37.3 m/s (b) $19.8^\circ, 70.2^\circ$
20. (a) maximum: May, minimum: Nov. / Dec.
(b) Sept. and Dec. (c) Mar. and June
21. (a) Plot the points given.
(c) $T(t) = 13.5 \sin \frac{\pi}{6}(t - 4.5) + 6.8$
(d) May and Sept.
22. (a) Plot the points from the table. Let x-axis represent month and
y-axis represent daily mean temperature.
(c) $H(t) = -102.7 \cos \frac{\pi}{6}t + 175.3$
(d) maximum: June, minimum: Dec.
(e) The model is reasonable but not exact. Individual results vary
up to 10%.
23. (a) two possible solutions
(b) 1.05, 5.24
24. $\frac{\pi}{4}, \frac{5\pi}{4}$
25. $25^\circ, 85^\circ, 205^\circ, 265^\circ$