

Cumulative Review Test 3, page 553

- All angles have their vertex at (0, 0) and initial arm on the positive x-axis.
 - principal angle: 260° , related acute angle: 80° , terminal arm rotated clockwise 100° stopping in 3rd quadrant
 - principal angle: 125° , related acute angle: 55° , terminal arm rotated counterclockwise 845° , stopping in 2nd quadrant
 - principal angle: $\frac{9\pi}{8}$, related acute angle: $\frac{\pi}{8}$, terminal arm rotated clockwise $\frac{7\pi}{8}$, stopping in 3rd quadrant
 - principal angle: $\frac{5\pi}{6}$, related acute angle: $\frac{\pi}{6}$, terminal arm rotated counterclockwise $\frac{17\pi}{6}$ stopping in 2nd quadrant
- vertex at (0, 0) and initial arm on the positive x-axis, terminal arm rotated counterclockwise passing through (-3, 8) in 2nd quadrant
 - $\sin \theta = \frac{8}{\sqrt{73}}$, $\cos \theta = \frac{-3}{\sqrt{73}}$, $\tan \theta = -\frac{8}{3}$
 - $\theta = 69^\circ$ or 110°
- $\frac{\pi}{12}$
 - $\frac{2\pi}{3}$
 - $\frac{-3\pi}{2}$
 - $\frac{6\pi}{5}$
- 390°
 - 160°
 - -225°
 - 146°
- amplitude: 3, period: 2π , phase shift: none, vertical shift: down 1, zeros at 19.5° , 160.5° ; y-intercept -1; max. $(90^\circ, 2)$, min. $(270^\circ, -4)$
 - period: 180° , phase shift: none, vertical shift: none, zeros at 0° , 180° , 360° ; asymptotes $x = 90^\circ$, $x = 270^\circ$
 - amplitude: 2, period: 360° , phase shift: 30° right, vertical shift: up 2, y-intercept 0.27; zero at 30° min. at $(30^\circ, 0)$; max. at $(210^\circ, 4)$
 - amplitude: 3, period: 180° , phase shift: 45° left, vertical shift: down 1, zeros at 35.3° , 144.7° , 215.3° , 324.7° ; max. at $(0^\circ, 2)$, $(180^\circ, 2)$, $(360^\circ, 2)$; min. at $(90^\circ, -4)$, $(270^\circ, -4)$
- amplitude: 0.5, period: $\frac{2\pi}{3}$, phase shift: $\frac{\pi}{6}$ right, vertical shift: up 4, y-intercept 4; max. at $(0.524, 4.5)$, $(2.618, 4.5)$, $(4.712, 4.5)$; min. at $(1.571, 3.5)$, $(3.665, 3.5)$, $(5.760, 3.5)$
 - amplitude: 5, period: 4π , phase shift: $\frac{4\pi}{3}$ right, vertical shift: up 1, y-intercept 5.33; zero at 4.592; max. at $(1.047, 6)$
- $h(t) = 10 \sin 10(t - 9) + 11$
 - 12.74 m
 - 18 s, 21 m
- $\theta = \frac{\pi}{6}, \frac{5\pi}{6}$
 - no solution
 - $\theta = 37.86^\circ, 82.14^\circ$
 - $x = 33.02^\circ, 123.02^\circ$
- $d(t) = 2.5 \sin \left[\frac{\pi}{6}(t - 1) \right] + 3.75$, y-intercept 2.6; max. at $(4, 6.25)$, $(16, 6.25)$; min. at $(10, 1.25)$, $(22, 1.25)$
 - 6.25 m
 - Yes; the minimum amount of water is 1.25 m, which is greater than 1 m.
- $b = 31.6$ cm, $\angle A = 28.2^\circ$, $\angle C = 22.8^\circ$
 - $a = 17.3$ cm, $\angle A = 52.1^\circ$, $\angle C = 72.9^\circ$
 - $\angle D = 46.1^\circ$, $\angle E = 60.1^\circ$, $\angle F = 73.8^\circ$
 - $q = 36.5$ cm, $r = 28.2$, $\angle S = 117^\circ$
- 446.8 cm²
- 14.87 km
- 0
 - $-\frac{\sqrt{3}}{2}$
 - 1
 - $-\frac{\sqrt{3}}{2}$
 - $-\frac{1}{6}$
 - $-\frac{\sqrt{3}}{2}$
- $0, \frac{\pi}{4}, \frac{3\pi}{4}, \pi, \frac{5\pi}{4}, \frac{7\pi}{4}, 2\pi$
 - $41.8^\circ, 138.2^\circ, 191.5^\circ, 348.5^\circ$
 - $\frac{\pi}{4}, \frac{5\pi}{4}$
 - $30^\circ, 150^\circ, 210^\circ, 330^\circ$
- high tide: 3:00 a.m. and 3:00 p.m., low tide: 9:00 a.m. and 9:00 p.m.