

IM2 Book 3 Selected Answers

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1. $10\sqrt{2}$
2. (a) $A = \left(\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}\right)$, $B = \left(\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$
(b) $\cos()$
(c) $\sin()$
3. (a) $\cos(40^\circ)$
(b) $\sin(40^\circ)$
4. (a) $m_{OA} = 1$, $m_{OB} = \frac{\sqrt{3}}{3}$
(b) $\tan()$
5. 470 ft
6. $\frac{3}{5}$
7. Length of line: 3.42 ft
Distance to bobber: 9.40 ft
8. 23.82 ft
9. (a) π ; $(-1, 0)$
(b) $\frac{\pi}{2}$; $(0, 1)$
10. –
11. –
12. –
13. $\cos A = \frac{\sqrt{21}}{5}$, $\tan A = \frac{2}{\sqrt{21}}$, $\sin^2 A + \cos^2 A = 1$
14. (a) 79 ft
(b) $7,873 \text{ ft}^2$
(c) 135 ft
15. 67°

16. 21.6°
17. No
18. 54.8 ft
19. $\frac{2\pi}{3}$
20. $\frac{6\pi}{5}, \frac{9\pi}{5}$
21. $\sin^2 \theta + \cos^2 \theta = 1$
22. length = 5.22; Area = 12.68
23. $\frac{ab \sin C}{2}$
24. 9.9 in^2
25. $(-1, 0), (-1, 0)$
26. -
27. $\pi - \alpha$
28. (a) $(0, 1)$
 (b) $\left(\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}\right)$
 (c) $\left(\frac{-1}{2}, \frac{\sqrt{3}}{2}\right)$
 (d) $\left(\frac{-\sqrt{3}}{2}, \frac{-1}{2}\right)$
29. (a) $\left(\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$; $\cos \theta$ gives the x-coordinate; $\sin \theta$ gives the y-coordinate
 (b) $\cos \frac{3\pi}{4} = \frac{-\sqrt{2}}{2}, \sin \frac{3\pi}{4} = \frac{\sqrt{2}}{2}$
30. (a) $AD = b - x, BD = \sqrt{a^2 - x^2}$
 (b) $c^2 = a^2 + b^2 - 2bx$
 (c) $c^2 = a^2 + b^2 - 2ab \cos C$
31. 5.01 in.
32. (a) $\left(\frac{1}{2}, \frac{\sqrt{3}}{2}\right), m = \sqrt{3}$
 (b) $\tan \theta$
33. 205°
34. (a) $\sin \frac{2\pi}{3} = \frac{\sqrt{3}}{2}, \cos \frac{2\pi}{3} = \frac{-1}{2}, \tan \frac{2\pi}{3} = -\sqrt{3}$
 (b) $\sin \frac{4\pi}{3} = \frac{-\sqrt{3}}{2}, \cos \frac{4\pi}{3} = \frac{-1}{2}, \tan \frac{4\pi}{3} = \sqrt{3}$
35. (a) $\sin 135^\circ = \frac{\sqrt{2}}{2}, \cos 135^\circ = \frac{-\sqrt{2}}{2}, \tan 135^\circ = -1$

$$(b) \sin 225^\circ = -\frac{\sqrt{2}}{2}, \cos 225^\circ = \frac{-\sqrt{2}}{2}, \tan 225^\circ = 1$$

$$36. (a) \left(\frac{\sqrt{3}}{2}, -\frac{1}{2} \right), m = -\frac{\sqrt{3}}{3}$$

$$(b) \sin\left(-\frac{\pi}{6}\right) = -\frac{1}{2}, \cos\left(-\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}, \tan\left(-\frac{\pi}{6}\right) = -\frac{\sqrt{3}}{3}$$

$$37. \sin\left(-\frac{2\pi}{3}\right) = -\frac{\sqrt{3}}{2}, \cos\left(\frac{5\pi}{2}\right) = 0, \tan\left(\frac{2\pi}{3}\right) = -\sqrt{3}$$

$$38. \cos A = -\frac{\sqrt{91}}{10}, \tan A = -\frac{3}{\sqrt{91}}$$

$$39. 2.52 \text{ km}$$

$$40. 16.8 \text{ cm}$$

$$41. 78.5^\circ, 57.1^\circ, 44.4^\circ$$

$$42. (a) c = p + q$$

$$(b) c = |p - q|$$

$$(c) c = \sqrt{p^2 + q^2}$$

$$43. (a) \sin 60^\circ = \sin 120^\circ = \frac{\sqrt{3}}{2}$$

$$(b) \sin 30^\circ = \sin 150^\circ = \frac{1}{2}$$