Trigonometry (MAC1114) Answer Key: Review for Final Exam

1. a) $\frac{3\pi}{4}$; b) $\frac{\pi}{15}$; c) $-\frac{7\pi}{4}$

2. a) 210°; b) 660°; c) 286°29'

3. $\sin\theta = -\frac{4}{5}$; $\cos\theta = -\frac{3}{5}$; $\tan\theta = \frac{4}{3}$;
$\csc\theta = -\frac{5}{4}$; $\sec\theta = -\frac{5}{3}$; $\cot\theta = \frac{3}{4}$

4. $\sin 135° = \frac{\sqrt{2}}{2}$; $\cos 135° = -\frac{\sqrt{2}}{2}$; $\tan 135° = -1$

5. $\sin\theta = -\frac{\sqrt{15}}{4}$; $\cos\theta = -\frac{1}{4}$;
$\csc\theta = -\frac{4\sqrt{15}}{15}$; $\sec\theta = -4$; $\cot\theta = \frac{\sqrt{15}}{15}$

6. a) 38°; b) 75°; c) $\frac{\pi}{6}$

7. a) $-\frac{\sqrt{3}}{3}$; b) $-\frac{\sqrt{3}}{2}$; c) $-\sqrt{2}$; d) $-\frac{1}{2}$

8. a) 120°; b) 240°; c) 300°

9. a) 84.5°; b) 8.13°; c) 3.72°

10. a) 213.6°; b) 326.1°

11. $b = 44.8cm$, $A = 33.3°$, $B = 56.7°$

12. 769.4 ft

13. a) 12.2 cm; b) 32.3 ft²

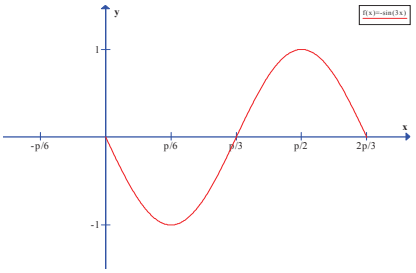
14. 0.25 radians = 14º

15. s = 22.2 cm

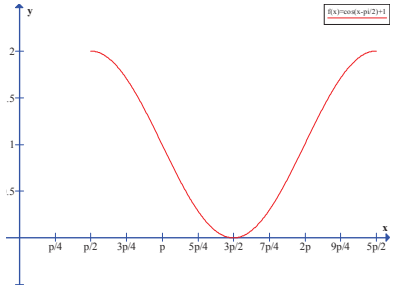
16.

	Domain	Range	Period	Amp.
a) $\sin x$	All Real	[-1, 1]	2π	1
b) $\cos x$	All Real	[-1, 1]	2π	1
c) $\tan x$	$\{x \mid x \neq \frac{\pi}{2} + k\pi\}$	All Real	π	n/a
d) $\csc x$	$\{x \mid x \neq k\pi\}$	$(-\infty,-1] \cup [1,\infty)$	2π	n/a
e) $\sec x$	$\{x \mid x \neq \frac{\pi}{2} + k\pi\}$	$(-\infty,-1] \cup [1,\infty)$	2π	n/a
f) $\cot x$	$\{x \mid x \neq k\pi\}$	All Real	π	n/a

17. a) Amplitude = 1, Period = $\frac{2\pi}{3}$, Reflection



b) Amplitude = 1, Period = 2π, Phase Shift = $\frac{\pi}{2}$,
Vertical Shift up 1



18. a) $\tan\theta = \frac{3\sqrt{5}}{2}$; b) $\csc\theta = \frac{5}{3}$

19. a) True; b) True; c) False
d) True; e) False; f) False
g) True; h) False

20. a) 37°; b) QII; c) QIV; d) QIII;
e) $\sec^2\theta$; f) $\cos^2\theta$; g) $\sin\theta$

21-28 Identities

29. a) $\frac{\sqrt{6}+\sqrt{2}}{4}$; b) $2+\sqrt{3}$

30. $\sin 2x = -\frac{120}{169}$; $\cos 2x = -\frac{119}{169}$; $\tan 2x = \frac{120}{119}$

31. a) $\frac{\sqrt{2+\sqrt{2}}}{2}$; b) $\frac{\sqrt{2-\sqrt{2}}}{2}$; c) $-\sqrt{2}-1$

32. $x = \frac{2\pi}{3}, \frac{4\pi}{3}$

33. $x = \frac{\pi}{2}, \frac{3\pi}{2}, \frac{\pi}{4}, \frac{5\pi}{4}$

34. $x = \frac{\pi}{2}, \frac{\pi}{6}, \frac{5\pi}{6}$

35. $\theta = 73°, 287°$

36. $\theta = 90°, 210°, 330°$

37. $\theta = 95°, 115°, 215°, 235°, 335°, 355°$

38. $\theta = 40°, 80°, 160°, 200°, 280°, 320°$

39. $A = 38°, b = 59.5cm, c = 33.6cm$

40. $B = 51.5°, A = 100.5°, a = 125.7\,ft$
$B' = 128.5°, A' = 23.5°, a' = 51\,ft$

41. $b = 18m, A = 62°, C = 23°$

42. $A = 32°, B = 62°, C = 86°$

43. 10.6 square units

44. 3654 sqft

45. $\frac{x^2}{9} + \frac{y^2}{16} = 1$

46. $x^2 - y^2 = 1$

47. $\frac{(x+5)^2}{16} + \frac{(y+3)^2}{16} = 1$

48. $y = -\frac{2}{5}x$

49. $8cis330°$

50. $z_1 z_2 = 6cis150°$
$\frac{z_1}{z_2} = \frac{3}{2}cis330°$

51. $2^{24}\,cis0°$

52. a) $(2, 210°)$
b) $(1, -1)$

53. a) $(x^2 + y^2)^2 = 8xy$
b) $r = 4\cos\theta$