

Q2 Summative Review

Secondary 3H

Unit 4 (no calc)

Radians

Convert the following into radians or degrees.

Name: Answer Key Class: _____

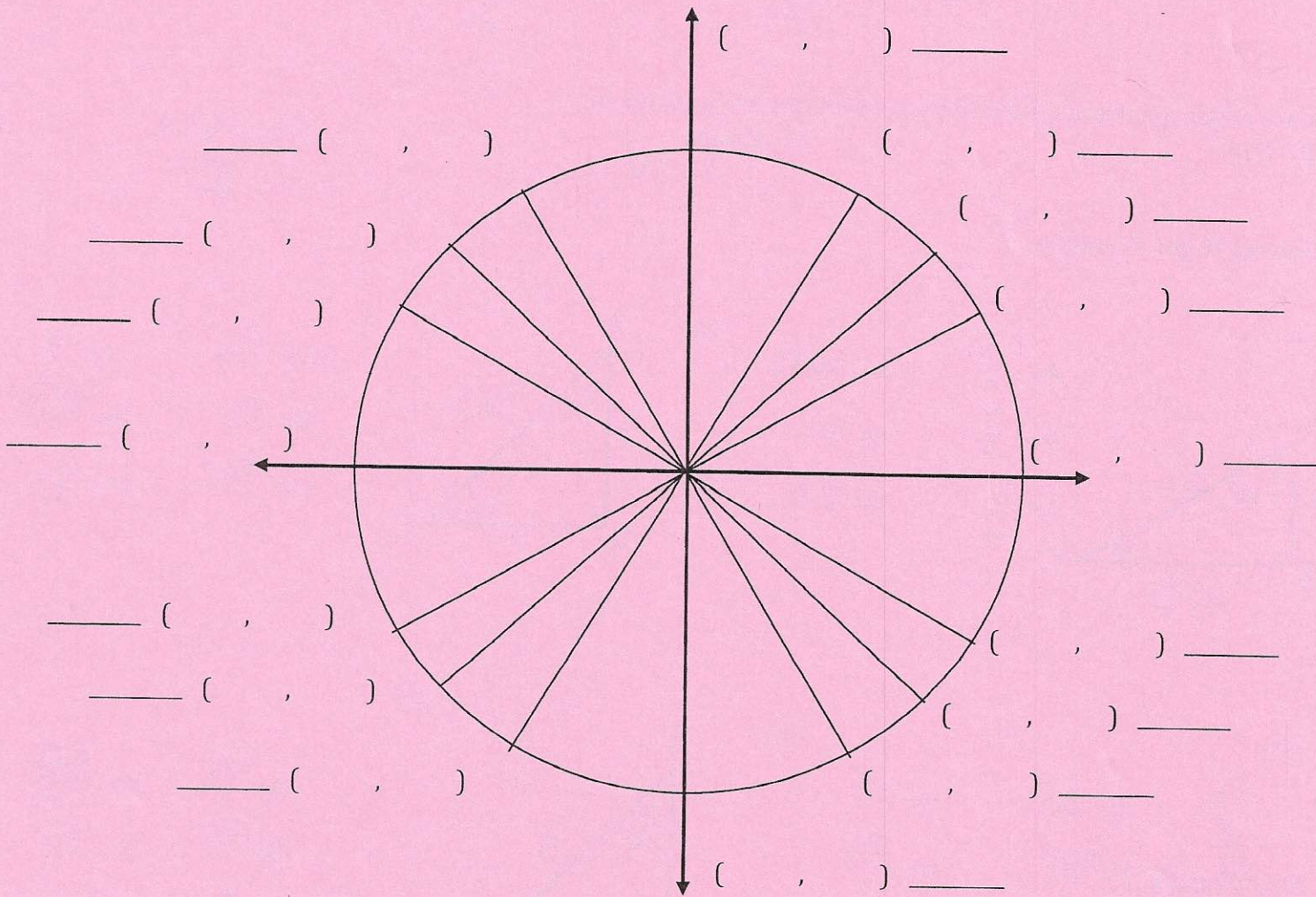
1. 330° $\frac{11\pi}{6}$

2. -135° $-\frac{3\pi}{4}$

3. $\frac{5\pi}{6}$ 150°

4. $-\frac{\pi}{4}$ -45°

Unit Circle



Find the exact value (acute angle only/on the interval $0 \leq \theta \leq \frac{\pi}{2}$).

5. $\sin^{-1}\left(\frac{1}{2}\right)$ $\frac{\pi}{6}, 30^\circ$

6. $\tan^{-1}(\sqrt{3})$ $\frac{\pi}{3}, 60^\circ$

7. $\sin\left(\tan^{-1}\frac{\sqrt{3}}{3}\right)$ $\frac{1}{2}$

8. $\cos^{-1}\left(\sin\frac{\pi}{3}\right)$ $\frac{\pi}{6} \approx 30^\circ$

Evaluate the following for θ .

9. $\cos\theta = -\frac{\sqrt{2}}{2}; 0 \leq \theta \leq \pi$

$-\frac{3\pi}{4}$

10. $\sec\theta = -\sqrt{2}; \pi \leq \theta \leq 2\pi$

$\frac{5\pi}{4}$

11. $\tan\theta = \sqrt{3}; \pi \leq \theta \leq 2\pi$

$\frac{4\pi}{3}$

Evaluate the following:

12. $\csc \frac{5\pi}{4} \quad \sqrt{2}$

13. $\cos \frac{11\pi}{6} \quad \frac{\sqrt{3}}{2}$

14. $\sin \frac{3\pi}{2} \quad -1$

15. $\cot \frac{\pi}{3} \quad \frac{\sqrt{3}}{3}$

16. $\sin \frac{7\pi}{6} \quad -\frac{\sqrt{3}}{2}$

17. $\tan \frac{5\pi}{6} \quad -\frac{\sqrt{3}}{3}$

18. $\sec \frac{7\pi}{4} \quad \frac{\sqrt{2}}{2}$

19. $\cos \pi \quad -1$

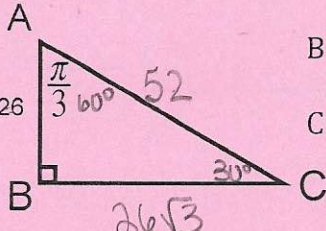
State which quadrants the following functions are positive in.

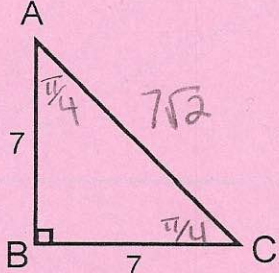
20. Sine I, II

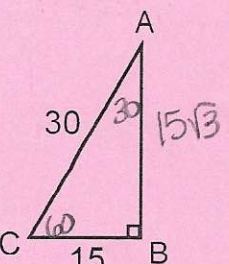
21. Cosine I, IV

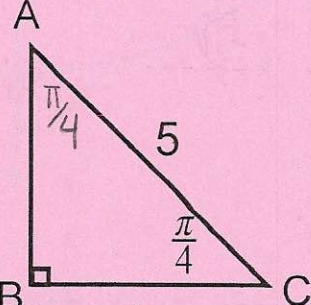
22. Tangent I, III

Solving Right Triangles

23.  $A = \frac{\pi}{3}$ $a = 26\sqrt{3}$
 $B = \frac{\pi}{2}$ $b = 52$
 $C = \frac{\pi}{6}$ $c = 26$

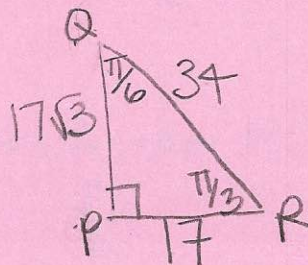
24.  $A = \frac{\pi}{4}$ $a = 7$
 $B = \frac{\pi}{2}$ $b = 7\sqrt{2}$
 $C = \frac{\pi}{4}$ $c = 7$

25.  $A = 30^\circ$ $a = 15$
 $B = 90^\circ$ $b = 30$
 $C = 60^\circ$ $c = 15\sqrt{3}$

26.  $A = \frac{\pi}{4}$ $a = \frac{5\sqrt{2}}{2}$
 $B = \frac{\pi}{2}$ $b = 5$
 $C = \frac{\pi}{4}$ $c = \frac{5\sqrt{2}}{2}$

27. Right $\triangle PQR$ with $\overline{PQ} \perp \overline{PR}$, $QR = 34$ and $m\angle Q = \frac{\pi}{6}$.

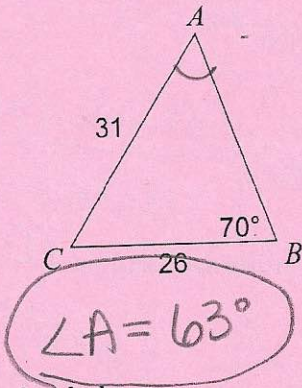
$P = \frac{\pi}{2}$ $p = 34$
 $Q = \frac{\pi}{6}$ $q = 17$
 $R = \frac{\pi}{3}$ $r = 17\sqrt{3}$



Unit 5

Law of Sines (calc)

28. Find angle A



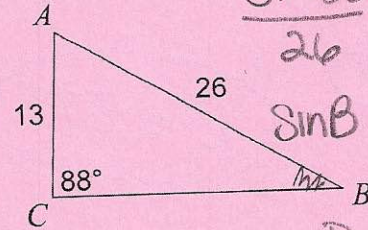
$$\frac{\sin 70}{31} = \frac{\sin A}{26}$$

$$\frac{26 \sin 70}{31} = \sin A$$

$$A = \sin^{-1}(\quad)$$

$\angle A = 63^\circ$

29. Find angle B



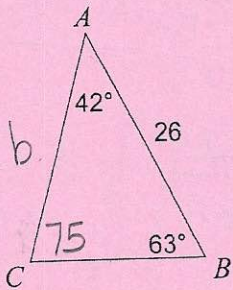
$$\frac{\sin 88}{26} = \frac{\sin B}{13}$$

$$\sin B = \frac{13 \sin 88}{26}$$

$$B = \sin^{-1}(\uparrow)$$

$B = 30^\circ$

30. Find side b



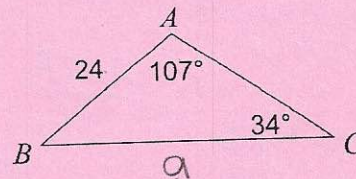
$$180 - 42 - 63 = 75$$

$$\frac{\sin 75}{26} = \frac{\sin 63}{b}$$

$$b = \frac{26 \sin 63}{\sin 75}$$

$b = 24.0$

31. Find side a

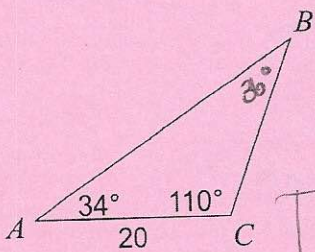


$$\frac{\sin 34}{24} = \frac{\sin 107}{a}$$

$$a = \frac{24 \sin 107}{\sin 34}$$

$a = 41.0$

32. Solve for all missing sides and angles



$$180 - 34 - 110 = 36$$

$$\frac{\sin 36}{20} = \frac{\sin 110}{c}$$

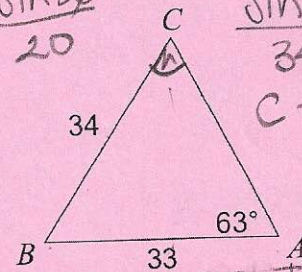
$$c = 32.0$$

$A = 34^\circ$	$a = 19.0$
$B = 36^\circ$	$b = 20$
$C = 110^\circ$	$c = 32.0$

33. Solve for all missing sides and angles

$$\frac{\sin 34}{a} = \frac{\sin 36}{20}$$

$$a = 19.0$$



$$\frac{\sin 63}{34} = \frac{\sin C}{33}$$

$$C = 60^\circ$$

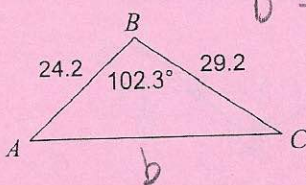
$A = 63^\circ$	$a = 34$
$B = 57^\circ$	$b = 32$
$C = 60^\circ$	$c = 33$

$$\frac{\sin 57}{b} = \frac{\sin 63}{34}$$

$(b = 32)$

Law of Cosines (calc)

34. Find side b

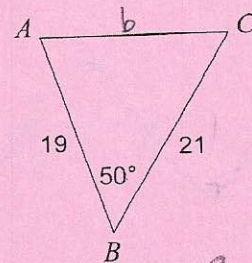


$$b^2 = 24.2^2 + 29.2^2 - 2(24.2)(29.2) \cos 102.3$$

$$b^2 = 1739.35$$

$b = 41.7$

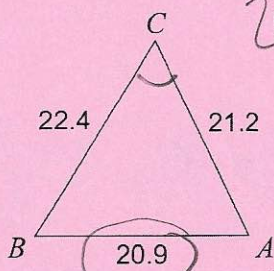
35. Find side b



$$b^2 = 19^2 + 21^2 - 2(19)(21) \cos 50$$

$b = 17.0$

36. Find angle C

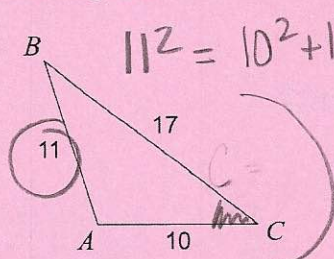


$$20.9^2 = 22.4^2 + 21.2^2 - 2(22.4)(21.2)\cos C$$

$$C = \cos^{-1}\left(\frac{20.9^2 - 22.4^2 - 21.2^2}{-2(22.4)(21.2)}\right)$$

$$C = 57^\circ$$

37. Find angle C

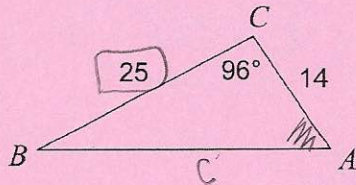


$$11^2 = 10^2 + 17^2 - 2(10)(17)\cos C$$

$$C = \cos^{-1}\left(\frac{11^2 - 10^2 - 17^2}{-2(10)(17)}\right)$$

$$C = 38^\circ$$

38. Solve for all sides and angles



$$c^2 = 25^2 + 14^2 - 2(25)(14)\cos 96$$

$$c = 29.9$$

$$\frac{\sin A}{25} = \frac{\sin 96}{c}$$

$$A = \sin^{-1}\left(\frac{25\sin 96}{c}\right)$$

$$A = 56^\circ$$

$$A = 56^\circ \quad a = 25$$

$$B = 28^\circ \quad b = 14$$

$$C = 96^\circ \quad c = 29.9$$

Graphing Trig (no calc)

State the amplitude, phase shift, period, and vertical shift of each of the following.

40. $y = 3\sin(4\theta) + 1$

amplitude = 3

period $\frac{2\pi}{4} = \frac{\pi}{2}$

vertical shift = 1 up

41. $f(x) = 2\cos\left(\theta - \frac{\pi}{2}\right)$

amplitude = 2

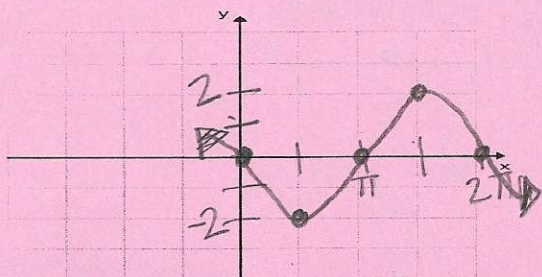
period $\frac{2\pi}{1} = 2\pi$

phase shift $\frac{\pi}{2}$ right

Graph the following.

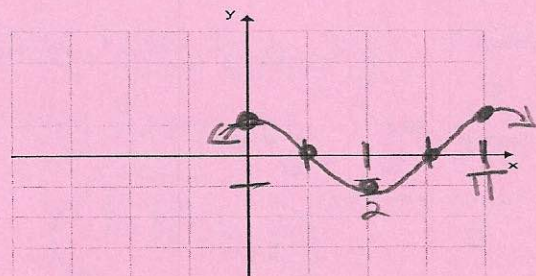
42. $f(x) = -2\sin(\theta)$

amp = 2
period = 2π

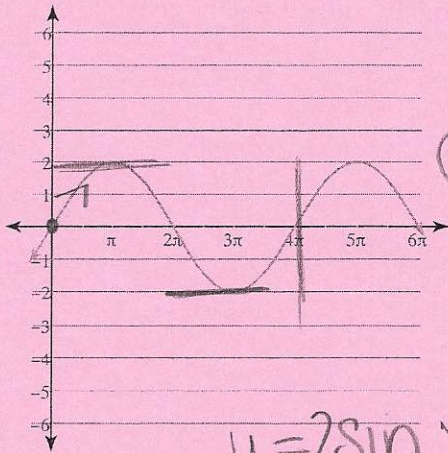


43. $f(x) = \cos(2\theta) - 1$

amplitude 1
period $\frac{2\pi}{2} = \pi$

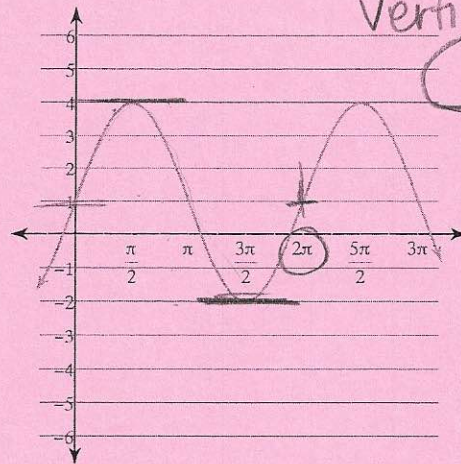


44. Write an equation for each of the following graphs:



period
 $\frac{2\pi}{\frac{1}{2}} = 4\pi$
 $b = \frac{1}{2}$
 amp. 2

$$y = 2\sin \frac{x}{2}$$



period 2π
 amp. = 3
 Vertical Shift $\uparrow 1$

$$y = 3\sin x + 1$$

Unit 6

Pythagorean Identities

Prove the following identities:

45. $(\sec^2 x + \csc^2 x) - (\tan^2 x + \cot^2 x) = 2$

$$= (\sec^2 x - \tan^2 x) + (\csc^2 x - \cot^2 x)$$

$$= 1 + 1$$

$$= 2$$

47. $\sin x(\tan x + \cot x) = \sec x$

$$= \sin x \left(\frac{\sin x}{\cos x} + \frac{\cos x}{\sin x} \right)$$

$$= \frac{\sin^2 x}{\cos x} + \cos x \left(\frac{\cos x}{\cos x} \right)$$

$$= \frac{\sin^2 x}{\cos x} + \frac{\cos^2 x}{\cos x} = \frac{1}{\cos x} = \sec x$$

49. $\frac{\sec x - \cos x}{\tan x} = \sin x$

46. $\frac{1 - \sin^2 \theta}{\sin^2 \theta} = \cot^2 \theta$

$$= \frac{\cos^2 \theta}{\sin^2 \theta}$$

$$= \cot^2 \theta$$

48. $\frac{1 - \cos^2 y}{\sin^2 y} = 1$

$$= \frac{1 - \cos^2 y}{\sin^2 y}$$

$$= \frac{\sin^2 y}{\sin^2 y}$$

$$= 1$$

Sum and Difference Identities

Evaluate:

50. $\tan 75^\circ \tan(30+45)$

$$\frac{\tan 30 + \tan 45}{1 - \tan 30 \tan 45}$$

$$\frac{\frac{\sqrt{3}}{3} + 1}{1 - \frac{\sqrt{3}}{3}(1)} = \frac{\frac{\sqrt{3}+3}{3}}{\frac{3-\sqrt{3}}{3}} = \frac{\sqrt{3}+3}{3-\sqrt{3}}$$

51. $\cos 15^\circ \cos(60-45)$

$$\frac{\sqrt{3}+3}{3-\sqrt{3}} \cdot \frac{(3+\sqrt{3})}{(3+\sqrt{3})}$$

$$\frac{3\sqrt{3}+3+9+3\sqrt{3}}{9-3} = \frac{12+6\sqrt{3}}{6} = 2+\sqrt{3}$$

$$\cos 60 \cos 45 + \sin 60 \sin 45$$

$$\frac{1}{2} \cdot \frac{\sqrt{2}}{2} + \frac{\sqrt{3}}{2} \cdot \frac{\sqrt{2}}{2}$$

$$\frac{\sqrt{2}}{4} + \frac{\sqrt{6}}{4}$$

52. $\sin 75^\circ \sin(30+45)$

$$\frac{\sin 30 \cos 45 + \cos 30 \sin 45}{\frac{1}{2} \cdot \frac{\sqrt{2}}{2} + \frac{\sqrt{3}}{2} \cdot \frac{\sqrt{2}}{2}}$$

$$\frac{\frac{\sqrt{2}}{4} + \frac{\sqrt{6}}{4}}{\frac{\sqrt{2}}{4} + \frac{\sqrt{6}}{4}}$$