Honors Math 2 Name Key

Quarter 3 Replacement Review Period_____ Date_____

Simplify each expression.

1. $\frac{x^2+2x-15}{x^2+7x+10}$

$\frac{(x+5)(x-3)}{(x+5)(x+2)} = \frac{x-3}{x+2}$

2. $\frac{8-14x-4x^2}{2x^2+x-1}$

$\frac{-2(2x^2+7x-4)}{(2x-1)(x+1)} =$

$\frac{-2(2x-1)(x+4)}{(2x-1)(x+1)} = \frac{-2x-8}{x+1}$

3. $\frac{5-x}{x-5} \div \frac{10x^3-2x^2}{4x^2-12x}$

$-1 \cdot \frac{4x^2-12x}{10x^3-2x^2} =$

$\frac{-4x(x-3)}{2x^2(5x-1)} = \frac{-2(x-3)}{x(5x-1)} = \frac{-2x+6}{5x^2-x}$

4. $\frac{5x-2}{x^2-9} - \frac{x+1}{x+3}$ $(x-3)$ $(x-3)$

$(x+3)(x-3)$

$\frac{5x-2-(x+1)(x-3)}{(x+3)(x-3)} =$

$\frac{5x-2+(-x^2+2x+3)}{(x+3)(x-3)} = \frac{-x^2+7x+1}{(x+3)(x-3)}$

5. $\frac{n+6}{2n+2} - \frac{n-5}{(n+1)}$ (2) (2)

$2(n+1)$

$\frac{n+6-2(n-5)}{2(n+1)} =$

$\frac{n+6-2n+10}{2(n+1)} = \frac{-n+16}{2(n+1)}$

6. $\frac{x}{2x-8} + \frac{-3}{6x+8}$ $(3x+4)$ $(x-4)$

$(3x+4)\ 2(x-4)\ 2(3x+4)(x-4)$

$\frac{x(3x+4)-3(x-4)}{2(3x+4)(x-4)} =$

$\frac{3x^2+4x-3x+12}{2(3x+4)(x-4)} = \frac{3x^2+x+12}{2(3x+4)(x-4)}$

7. $\frac{\frac{x}{x+1}+\frac{-4}{x+1}}{x^3}$

$\frac{\frac{(x-4)}{x+1}}{\frac{x^3}{1}} = \frac{(x-4)}{x+1} \cdot \frac{1}{x^3} = \frac{x-4}{x^3(x+1)}$

8. $\frac{\frac{x+2}{4}+\frac{-x+3}{8}}{\frac{x+1}{x^2}}$

$\frac{\frac{2x+4-x-3}{8}}{\frac{x+1}{x^2}} = \frac{\frac{x+1}{8}}{\frac{x+1}{x^2}} = \frac{x+1}{8} \cdot \frac{x^2}{x+1} = \frac{x^2}{8}$

Solve for x.

9. $\frac{1}{2x} + \frac{3}{x+7} = \frac{-1}{x}$ LCD: $2x(x+7)$

$1(x+7) + 3(2x) = -1(2)(x+7)$

$x + 7 + 6x = -2x - 14$

$7x + 7 = -2x - 14$

$9x = -21$

$x = -7/3$

10. $\frac{2x}{x-2} = \frac{1}{x^2-4} + \frac{1}{1}$ LCD: $(x+2)(x-2)$

$(x+2)(x-2)$

$2x(x+2) = 1 + (x+2)(x-2)$

$2x^2 + 4x = 1 + x^2 - 4$

$x^2 + 4x + 3 = 0$

$(x+3)(x-1) = 0$

$x = -3, 1$

Convert each degree measure into radians.

11. $248°$

$248°\left(\frac{\pi}{180°}\right) = \frac{62\pi}{45}$

12. $-18°$

$-18°\left(\frac{\pi}{180°}\right) = -\frac{\pi}{10}$

Convert each radian measure into degrees.

13. $\frac{5\pi}{3}$

$\frac{5\cancel{\pi}}{3}\left(\frac{180°}{\cancel{\pi}}\right) = 300°$

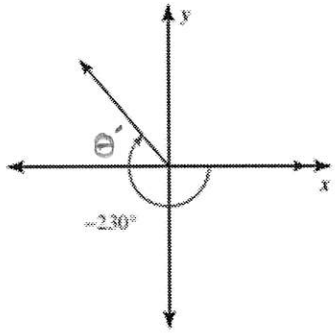
14. $\frac{-6\pi}{11}$

$-\frac{6\cancel{\pi}}{11}\left(\frac{180°}{\cancel{\pi}}\right) = \frac{-1080°}{11} \approx -98.18°$

Find the reference angle.

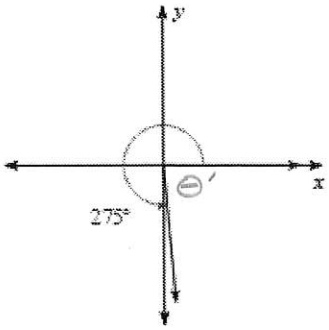
15.

$\theta' = 50°$



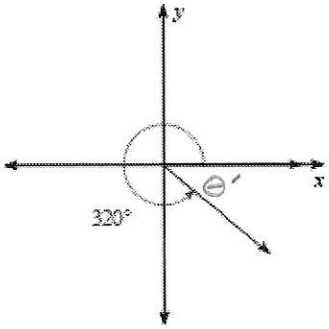
16.

$\theta' = 85°$



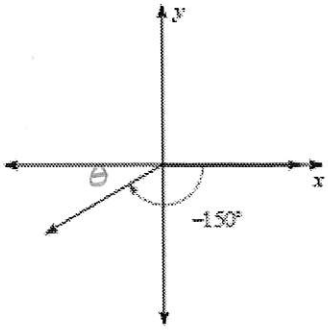
17.

$\theta' = 40°$



18.

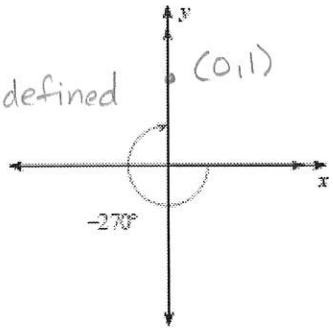
$\theta' = 30°$



Find the exact value of each trigonometric function. use unit circle

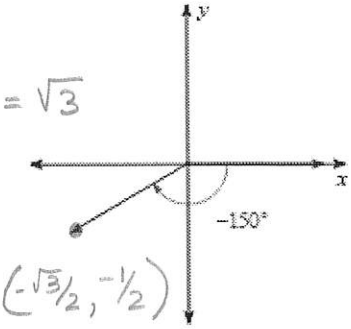
19. $\tan\theta$

$\tan\theta = \frac{1}{0}$ = undefined



20. $\cot\theta$

$\cot\theta = \frac{-\sqrt{3}}{-1} = \sqrt{3}$



21. $\sec 405° \Rightarrow \sec 45° = \frac{2}{\sqrt{2}} = \sqrt{2}$

22. $\csc 120° = \frac{2}{\sqrt{3}} = \frac{2\sqrt{3}}{3}$

23. $\sin 210° = -\frac{1}{2}$

24. $\cos(-120°) = -1/2$

Solve each triangle.

25.

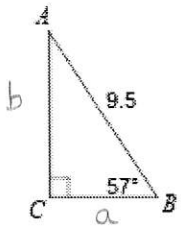
$\sin 57° = \frac{b}{9.5}$

$b = 9.5 \sin 57° = 7.96$

$\cos 57° = \frac{a}{9.5}$

$a = 9.5 \cos 57° = 5.17$

$\angle A = 33°$



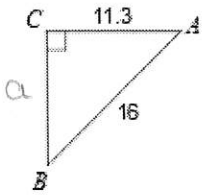
26.

$a = \sqrt{16^2 - 11.3^2}$

$a = 11.3$

$\angle A \approx 45°$

$\angle B \approx 45°$



$\cos A = \frac{11.3}{16}$

$\cos^{-1}\left(\frac{11.3}{16}\right) = \angle A$

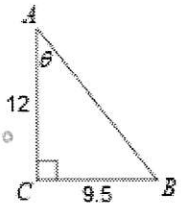
$\angle A = 45.06°$

Find the measure of the indicated angle.

27.

$\tan\theta = \frac{9.5}{12}$

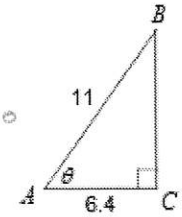
$\tan^{-1}\left(\frac{9.5}{12}\right) = \theta = 36.9°$



28.

$\cos\theta = \frac{6.4}{11}$

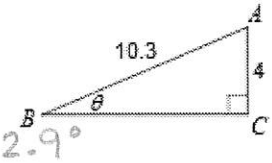
$\cos^{-1}\left(\frac{6.4}{11}\right) = \theta = 54.4°$



29.

$\sin\theta = \frac{4}{10.3}$

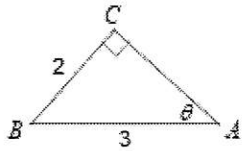
$\sin^{-1}\left(\frac{4}{10.3}\right) = \theta = 22.9°$



30.

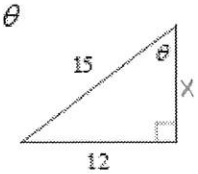
$\sin\theta = \frac{2}{3}$

$\sin^{-1}(2/3) = \theta = 41.8°$



Find the value of the indicated trigonometric function.

31. $\cos\theta$

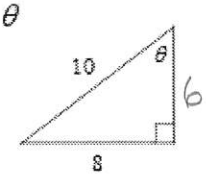


$x = \sqrt{15^2 - 12^2}$

$x = 9$

$\cos\theta = \frac{9}{15} = \frac{3}{5}$

32. $\cot\theta$



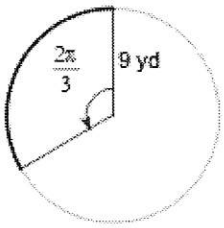
$\cot\theta = \frac{6}{8} = \frac{3}{4}$

Find the length of each arc. $s = r\theta$ $\qquad s = \theta/360^\circ\,(2\pi r)$

33.

$s = 9(2\pi/3)$

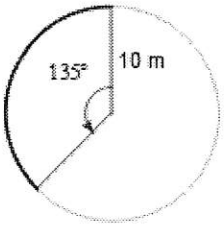
$s = 6\pi \approx 18.8$ yd



34.

$s = \frac{135^\circ}{360^\circ}(2\pi(10))$

$s = 23.6$ m

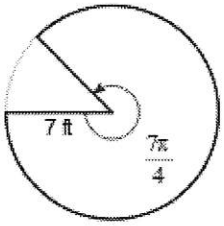


Find the area of each sector. $A = \frac{1}{2}r^2\theta$ $\qquad A = \theta/360^\circ\,(\pi r^2)$

35.

$A = \frac{1}{2}(7)^2(7\pi/4)$

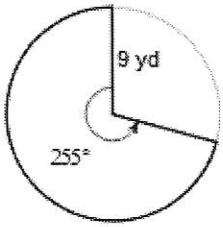
$A = 134.7$ ft^2



36.

$A = \frac{255^\circ}{360^\circ}(\pi \cdot 9^2)$

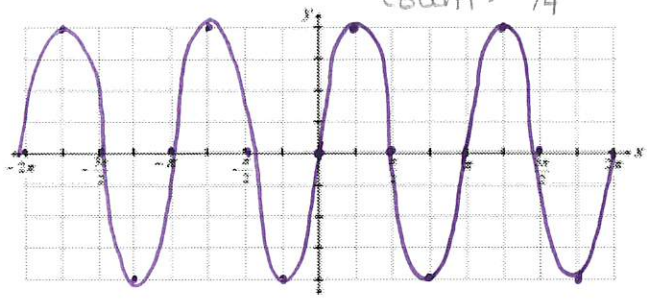
$A = 180.3$ yd^2



Sketch the graph of the function over the interval $-2\pi \le x \le 2\pi$.

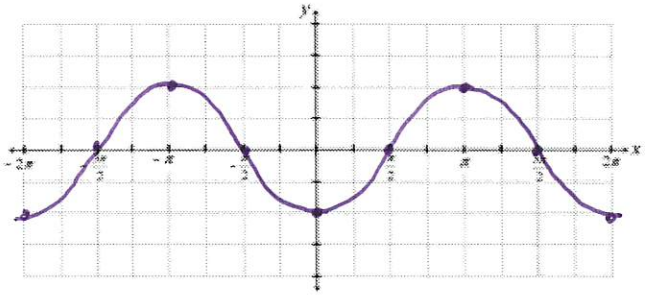
37. $y = 4\sin 2x$ $\qquad P = \frac{2\pi}{2} = \pi$

count: $\pi/4$



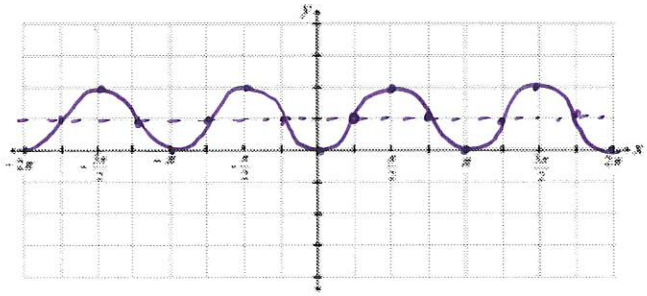
38. $y = -2\cos x$ $\qquad P = 2\pi$

count: $\pi/2$



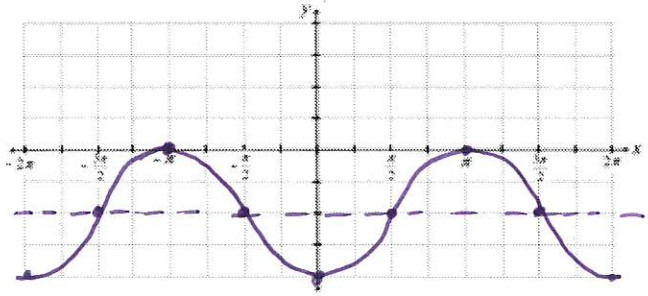
39. $y = \sin\left(2x - \frac{\pi}{2}\right) + 1$ $\qquad P = \frac{2\pi}{2} = \pi$ right $\frac{\pi}{4}$

count: $\pi/4$ up 1



40. $y = 2\cos(x + \pi) - 2$ $\qquad P = 2\pi$ left π

count: $\pi/2$ down 2

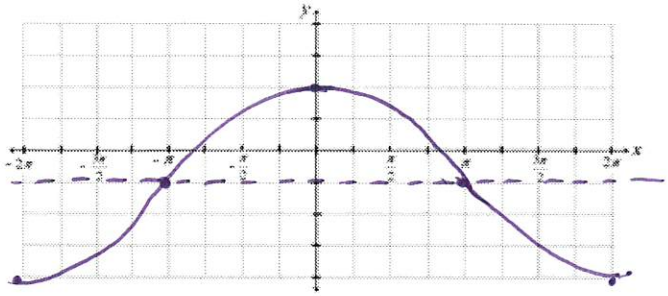


41. $y = 3\cos\frac{1}{2}x - 1$

$P = \frac{2\pi}{1/2} = 4\pi$

count: π

down 1

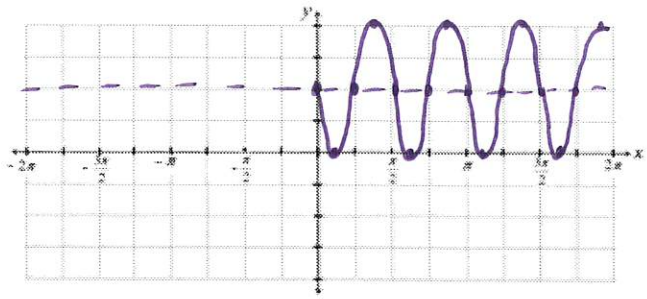


42. $y = -2\sin(4x) + 2$

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

count: $\pi/8$

up: 2



Determine the amplitude, period, phase shift, vertical shift, domain, and range for each.

43. $y = 2 + 3\sin\left(4x + \frac{\pi}{2}\right)$

amp: 2

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

left $\pi/8$

up 2

D: $\mathbb{R}$

R: $[-1, 5]$

44. $y = 2\cos(x - \pi)$

amp: 2

period: 2π

Right π

D: $\mathbb{R}$

R: $[-2, 2]$

45. $y = \frac{1}{2}\cos 2x - 4$

amp: $1/2$

period: $2\pi/2 = \pi$

down 4

D: $\mathbb{R}$

R: $[-4.5, -3.5]$

46. $y = 3 + 4\sin(x - \pi)$

amp: 4

period: 2π

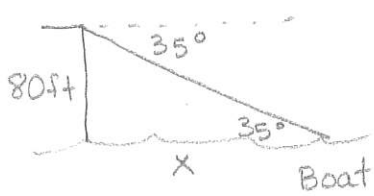
right π

up 3

D: $\mathbb{R}$

R: $[-1, 7]$

47. A cliff is 80 feet above the sea. From the cliff the angle of depression to a boat is 35°. How far is the boat from the base of the cliff?

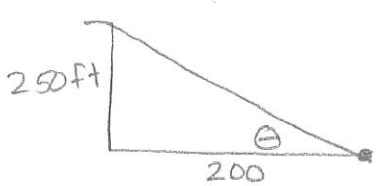


$\tan 35° = \frac{80}{x}$

$x = \frac{80}{\tan 35°}$

$x = 114.3$ ft

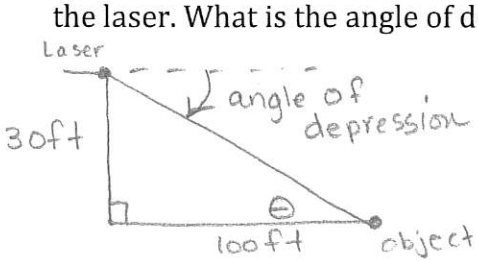
48. The height of a building is 250 ft. What is the angle of elevation from a point on the level ground 200 ft away from the base of the building?



$\tan\theta = \frac{250}{200}$

$\tan^{-1}\left(\frac{250}{200}\right) = \theta = 51.3°$

49. For a laser light show at an amusement park, the laser beam directed from the top of a 30 ft building is to reflect from an object that is 100 ft away from a point directly below the location of the laser. What is the angle of depression from the laser to the reflecting object?



$\tan\theta = \frac{30}{100}$

$\tan^{-1}(30/100) = \theta = 16.7°$

angle of depression $= 16.7°$ same as angle of elevation