

NAME _____

Last Year's Teacher : _____

Section 1: Trigonometry

Determine the exact value of each without using a calculator:

1. $\sin 0$

2. $\sin \frac{\pi}{3}$

3. $\sin \frac{7\pi}{4}$

4. $\cos \frac{\pi}{4}$

5. $\cos 3\pi$

6. $\cos \frac{11\pi}{6}$

7. $\tan \frac{3\pi}{4}$

8. $\tan \frac{7\pi}{6}$

9. $\tan \frac{5\pi}{3}$

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

11. $\cos^{-1}\left(\frac{\sqrt{3}}{2}\right)$

12. $\arctan(-1)$

13. $\cos\left(\sin^{-1}\left(\frac{\sqrt{2}}{2}\right)\right)$

14. $\cos^{-1}\left(\tan\left(\frac{\pi}{4}\right)\right)$

15. $\sin\left(\arctan\left(-\frac{3}{4}\right)\right)$

16. List the Pythagorean Trigonometric Identities: _____

17. List the Double Angle Trigonometric Identities: $\sin 2x =$ _____
 $\cos 2x =$ _____

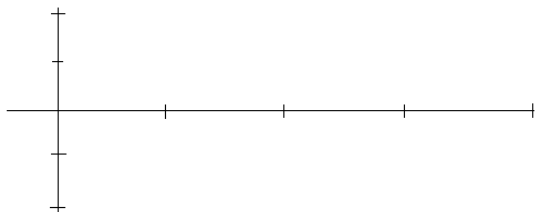
18. Find all the exact solutions to $2\sin^2(x) + 3\sin(x) - 2 = 0$ on the interval $[0, 2\pi)$.

19. Solve the equation: $2\sin^2(x)\cos(x) = \cos(x)$ on the interval $[0, 2\pi)$.

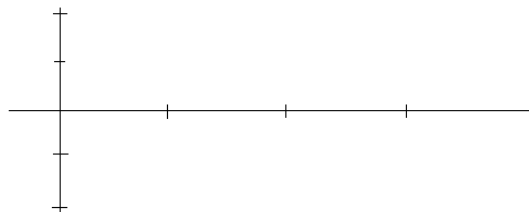
20. Use Trigonometric Identities to simplify: $(\csc(x) - \tan(x))\sin(x)\cos(x)$

21. Graph the following from $[0, 2\pi]$

a. $y = \sin \theta$



b. $y = \cos \theta$



Section 2: Exponential Functions and Logarithms

Simplify:

1. $e^{3+\ln x}$

2. $e^{\ln 3}$

3. $e^{3\ln x}$

4. $\ln e^3$

5. $\ln e^{2x}$

6. $\ln 1$

7. $\log_{\frac{1}{2}} 8$

8. $\frac{x^{13}}{x^6}$

9. $\frac{x^3}{\sqrt{x}}$

10. $27^{\frac{2}{3}}$

11. $\left(125x^{\frac{2}{3}}\right)^{\frac{1}{3}}$

12. $\sqrt[4]{x}\sqrt[5]{x}$

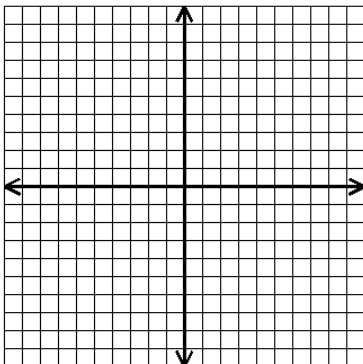
13. $\frac{x^{\frac{5}{2}}}{\sqrt{x}}$

14. $\left(\frac{x}{\sqrt[4]{x^3}}\right)^6$

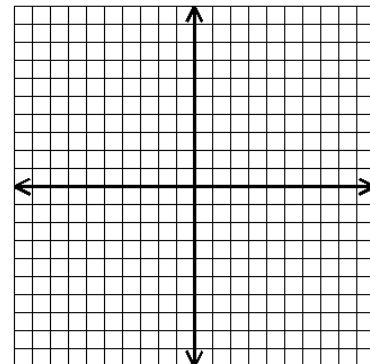
15. $\frac{e^{4x}}{e^3}$

Graph the following:

16. $y = 2^x$



17. $y = \log_4 x$



Section 3: Algebra Review

Simplify the following:

1. $\frac{\frac{2}{3}}{\frac{4}{5}}$

2. $\frac{\frac{1}{x} + \frac{1}{y}}{xy}$

3. $\frac{\frac{1}{x} - x}{x + \frac{1}{x}}$

4. $\frac{x+3}{x^2-9}$

5. $\frac{x^2+4x-12}{x^2+6x-16}$

6. $\frac{x^3-7x^2-8x}{x^3-8x^2-2x+16}$

For #'s 7-12, find the following for each function:

A. zero's

B. y-intercept

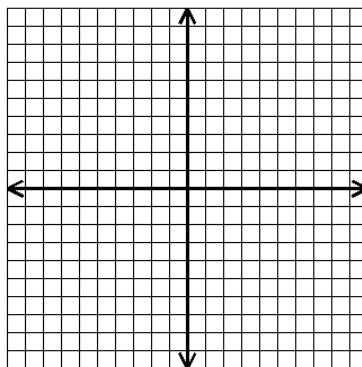
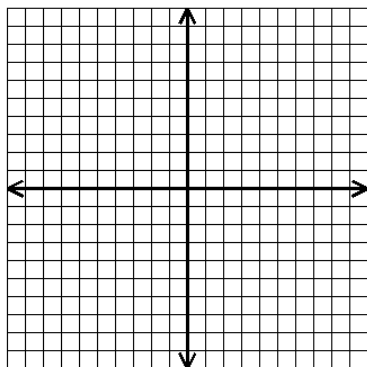
C. domain (interval notation)

D. range

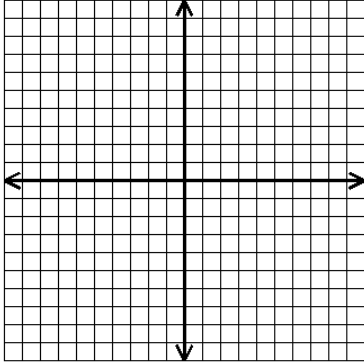
E. graph

7. $f(x) = \sqrt{9-x^2}$

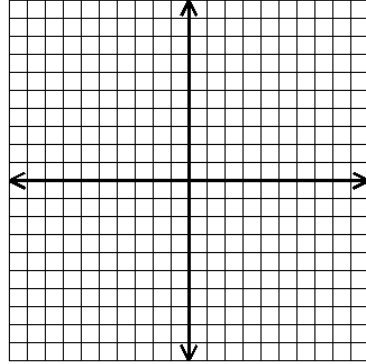
8. $f(x) = \frac{x-4}{x^2-16}$



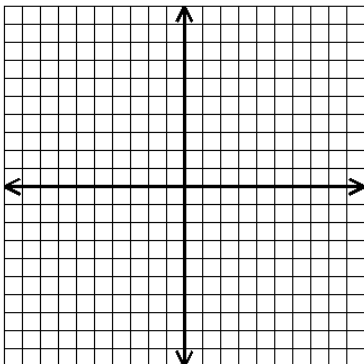
9. $f(x) = x^3 - 5x^2 - 14x$



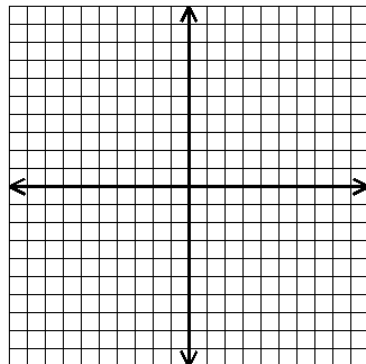
10. $f(x) = \begin{cases} -x^2, & x < -2 \\ x^3, & -2 \leq x \leq 2 \\ -2x+1, & x > 2 \end{cases}$



11. $f(x) = \sqrt{x+4}$



12. $f(x) = \frac{1}{x}$



For #'s 13-16, write the equation of a line in point-slope form: $y - y_1 = m(x - x_1)$

13. A line containing $(-2, 5)$ and $(3, -2)$

14. A line containing $(4, -1)$ and the origin.

15. A horizontal line with a y-intercept at -3.

16. A vertical line with a root at 5.

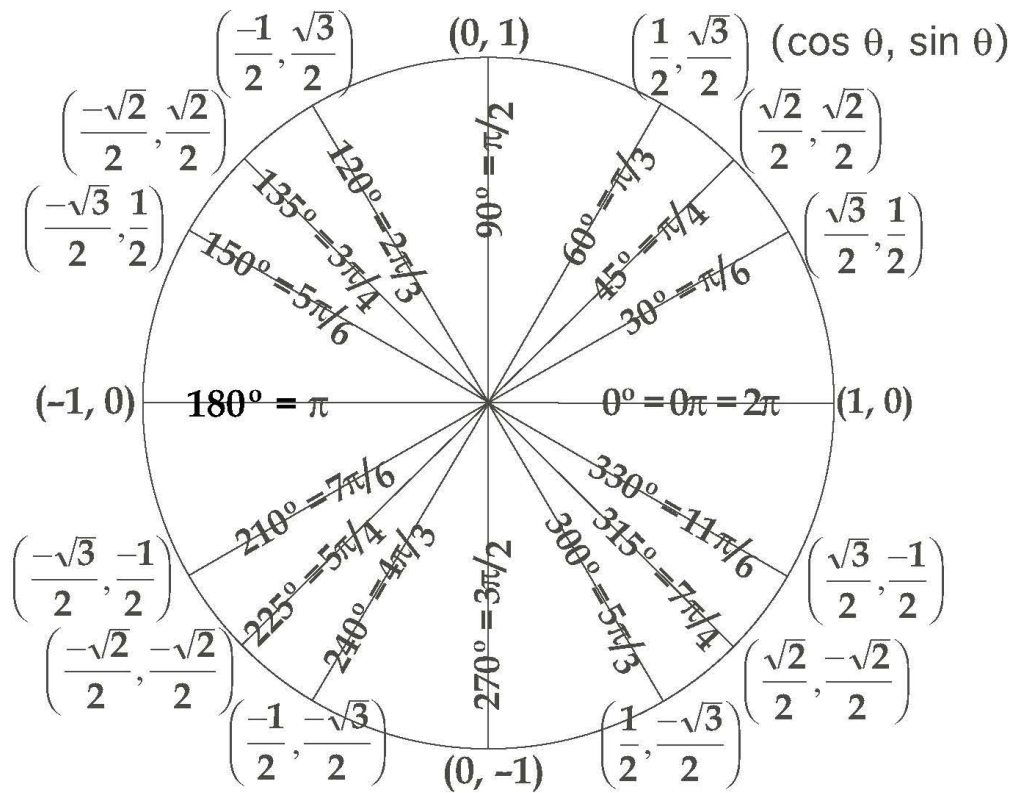
17. Quickly expand the binomial $(2x - 3)^4$

18. Simplify: $x^{\frac{3}{2}} \left(x + x^{\frac{5}{2}} - x^2 \right)$

19. Use sign analysis to solve: $\frac{x-4}{x+3} - \frac{4}{x} > 0$

20. Use the difference quotient, $\frac{f(x+h) - f(x)}{h}$, to find the slope of the secant line for: $f(x) = 3x^2 - 1$

21. Find the point(s) of intersection for: $f(x) = x^2 + 4x - 32$ and $g(x) = 3x + 5$, also state the domain where $g(x) > f(x)$ and where $f(x) > g(x)$



	$\sin \theta$	$\cos \theta$	$\tan \theta$	$\cot \theta$	$\sec \theta$	$\csc \theta$
$0^\circ = 0\pi = 2\pi$	0	1	0	---	1	---
$30^\circ = \pi/6$	1/2	$\sqrt{3}/2$	$\sqrt{3}/3$	$\sqrt{3}$	$2\sqrt{3}/3$	2
$45^\circ = \pi/4$	$\sqrt{2}/2$	$\sqrt{2}/2$	1	1	$\sqrt{2}$	$\sqrt{2}$
$60^\circ = \pi/3$	$\sqrt{3}/2$	1/2	$\sqrt{3}$	$\sqrt{3}/3$	2	$2\sqrt{3}/3$
$90^\circ = \pi/2$	1	0	---	0	---	1
$120^\circ = 2\pi/3$	$\sqrt{3}/2$	-1/2	$-\sqrt{3}$	$-\sqrt{3}/3$	-2	$2\sqrt{3}/3$
$135^\circ = 3\pi/4$	$\sqrt{2}/2$	$-\sqrt{2}/2$	-1	-1	$-\sqrt{2}$	$\sqrt{2}$
$150^\circ = 5\pi/6$	1/2	$-\sqrt{3}/2$	$-\sqrt{3}/3$	$-\sqrt{3}$	$-2\sqrt{3}/3$	2
$180^\circ = \pi$	0	-1	0	---	-1	---
$210^\circ = 7\pi/6$	-1/2	$-\sqrt{3}/2$	$\sqrt{3}/3$	$\sqrt{3}$	$-2\sqrt{3}/3$	-2
$225^\circ = 5\pi/4$	$-\sqrt{2}/2$	$-\sqrt{2}/2$	1	1	$-\sqrt{2}$	$-\sqrt{2}$
$240^\circ = 4\pi/3$	$-\sqrt{3}/2$	-1/2	$\sqrt{3}$	$\sqrt{3}/3$	-2	$-2\sqrt{3}/3$
$270^\circ = 3\pi/2$	-1	0	---	0	---	-1
$300^\circ = 5\pi/3$	$-\sqrt{3}/2$	1/2	$-\sqrt{3}$	$-\sqrt{3}/3$	2	$-2\sqrt{3}/3$
$315^\circ = 7\pi/4$	$-\sqrt{2}/2$	$\sqrt{2}/2$	-1	-1	$\sqrt{2}$	$-\sqrt{2}$
$330^\circ = 11\pi/6$	-1/2	$\sqrt{3}/2$	$-\sqrt{3}/3$	$-\sqrt{3}$	$2\sqrt{3}/3$	-2

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