Precalc review **Complete the following Family of functions table**

Function	Graph	Domain	Range (Bounded ?)	Asymptotes	Even,Odd, Neither
Identity Function $f(x) = x$					
Square Function $f(x) = x^2$					
Cube Function $f(x) = x^3$					
Reciprocal Function $f(x) = 1/x$					
Square Root Function $f(x) = \sqrt{x}$					
Exponential Function $f(x) = e^x$					
Natural Logarithm Function $f(x) = \ln x$					
Sine Function $f(x) = \sin x$					
Cosine Function $f(x) = \cos x$					
Absolute Value Function $f(x) = \lvert x \rvert$					
Logistic Function $f(x) = \frac{1}{1+e^{-x}}$					

Precalc-review

Show all work – No credit will be given for answers missing appropriate work. No calculators.
Simplify the rational expression. State any restrictions on the variables domain.

1) $\frac{p^2 - 4p - 32}{p+4}$

2) $\frac{q^2+11q+24}{q^2 - 5q - 24}$

Multiply or divide. State any restrictions on the variables domain.

4) $\frac{4a^5}{7b^4} \bullet \frac{2b^2}{2a^4}$

5) $\frac{z^2}{z+1} \bullet \frac{z^2+3z+2}{z^2+3z}$

6) $\frac{c+1}{c-5} \bullet \frac{c-2}{c^2-7c+10}$

Add or subtract. Simplify, if possible.

7) $\frac{7}{a+8} + \frac{7}{a^2-64}$

8) $\frac{3}{a-2} - \frac{1}{a+2}$

Simplify the complex fraction.

9) $\dfrac{\frac{1}{a+2} - \frac{2}{a-2}}{\frac{2}{a+2} + \frac{1}{a-2}}$

Solve each equation or inequality for x over the set of real numbers.

11. $2x^4 + 3x^3 - 2x^2 = 0$

12. $\dfrac{2x-7}{x+1} = \dfrac{2x}{x+4}$

13. $\dfrac{3x+5}{(x-1)(x^4+7)} = 0$

14. $\sqrt{x^2-9} = x-1$

15. $|2x-3| = 14$

16. $x^2 - 2x - 8 < 0$

17.For the following function find:
Asymptotes
Intercepts
Positive/negative

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

Write the following equations described.

19. Write the equations of a line that is parallel to y=2x+3 and passes through the point (6,2).

20. Write the equation of a line that is perpendicular to y=-3/2x -3 and passes through the point (6,7).

21. Use your knowledge of the unit circle to evaluate each of the following. Leave your answers in radical form.

Given the function below, find the amplitude, period, and phase shift (if any):

	Amplitude	**Period**	**Phase shift (if any)**
$f(x)=\frac{1}{2}\sin\left(2x+\frac{\pi}{3}\right)$	_____	_____	_____
$f(x)=-3\cos\left(\frac{x}{2}-\frac{\pi}{2}\right)$	_____	_____	_____
$f(x)=4\sin\left(\frac{x}{3}-\pi\right)$	_____	_____	_____
$f(x)=2+\sin\left(\frac{2}{3}x\right)$	_____	_____	_____

Use your knowledge of the unit circle to evaluate each of the following. Leave all answers in simplest radical form.

5. $\sin(30^\circ)$

6. $\cos\frac{2\pi}{3}$

7. $\tan(45^\circ)$

8. $\sin(-\frac{\pi}{6})$

9. $\tan\pi$

10. $\csc\frac{5\pi}{6}$

11. $\cos(90^\circ)$

12. $\cos\frac{3\pi}{4}$

13. $\tan\frac{\pi}{6}$

14. $\cos^{-1}\left(\frac{1}{2}\right)$

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

16. $\tan^{-1}(1)$

Solve each trigonometric equation for $0 \le x \le 2\pi$.

17. $\sin x = \frac{\sqrt{3}}{2}$

18. $\tan^2 x = 1$

19. $\cos\frac{x}{2} = \frac{\sqrt{2}}{2}$

20. $2\sin^2 x + \sin x - 1 = 0$

Solve each exponential or logarithmic equation.

21. $5^x = 125$

22. $8^{x+1} = 16^x$

23. $81^{\frac{3}{4}} = x$

24. $8^{\frac{-2}{3}} = x$

25. $\log_x \frac{1}{9} = -2$

26. $\log_4 x = 3$

27. $\log_3(x+7) = \log_3(2x-1)$

Expand each of the following.

28. $\log_3 5x^2$

29. $\ln \frac{5x}{y^2}$

Complete each of the following using trig identities and formulas.

30. $\sin\left(\frac{\pi}{2} - x\right) =$ _____

31. $\sin^2 + \cos^2 x =$ _____

32. $\sin 2u =$ _____

33. $\tan x =$ _____

34. $1 + \cot^2 x =$ _____

35. $1 - \cos^2 x =$ _____