Skills from previous math classes that you need to self-review for Math 43

From Algebra:

Equations of lines (slope-point form)
Graphs of linear equations
Quadratic functions
        Graphing
        Factoring
        Quadratic formula
        Completing the square
Rational expressions
        Add / subtract

From Geometry:

Areas
        Triangles / parallelograms

From Trigonometry:

Sine / cosine / tangent of special angles on unit circle
Inverse sine / cosine / tangent of special values
Pythagorean / reciprocal / quotient / negative angle / co-function identities
Double angle / sum & difference of angles identities
Trigonometric equations

From Precalculus:

Graphs of basic functions (domain, range, intercepts, asymptotes, long run behavior)

Power	$y = x^n$ (n could be positive or negative, even or odd or reciprocal of integer)
Exponential	$y = b^x$ (b could be greater than or less than 1)
Logarithmic	$y = \log_b x$ (b could be greater than or less than 1)
Trigonometric	$y = \sin x$, $y = \cos x$, $y = \tan x$, $y = \csc x$, $y = \sec x$ or $y = \cot x$
Inverse trigonometric	$y = \sin^{-1} x$, $y = \cos^{-1} x$ or $y = \tan^{-1} x$

Single step transformations of functions & graphs (relationship between algebraic & graphical transformations)
        Horizontal / vertical
        Shift / reflect / stretch & compress
Symmetry of functions & graphs (relationship between algebraic & graphical symmetry)
   Even / odd

Unless stated otherwise, you must be able to solve these
without your calculator

[1]   Find the **slope-point** form of the equation of the line through the points $(-1, -3)$ and $(-6, 4)$.

[2]   Sketch the graph of the equation $2x - 3y = -12$ by finding the $x-$ and $y-$ intercepts.

[3]   Sketch $f(x) = x^2 - 6x - 16$ by finding the $x-$ and $y-$ intercepts and the vertex (without any additional points).

[4]   Solve $3x^2 - 2x = 9$.

[5]   Complete the square for $-2x^2 + 24x - 3$. **NOTE: This does NOT involve solving an equation.**

[6]   Add and simplify $\dfrac{x-7}{x^2 - 4x + 3} + \dfrac{x+7}{x^2 - x - 6}$.

[7]   Find the area of the parallelogram $ABCD$ on the right.

[8]   Find the area of the triangle PQR on the right.
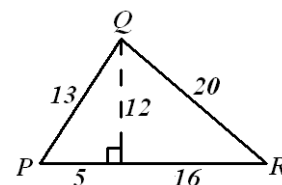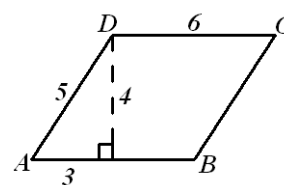
[9]   Fill in the following table with all entries (in radians) that have exact values. Also, identify the entries which do not exist.

$x =$	$-\dfrac{\sqrt{3}}{2}$	$-\dfrac{\sqrt{3}}{3}$	$-\dfrac{\sqrt{2}}{2}$	$-\sqrt{3}$	$-\dfrac{1}{2}$	-1	0	1	$\dfrac{1}{2}$	$\sqrt{3}$	$\dfrac{\sqrt{2}}{2}$	$\dfrac{\sqrt{3}}{3}$	$\dfrac{\sqrt{3}}{2}$
$\tan^{-1} x =$													
$\cos^{-1} x =$													
$\sin^{-1} x =$													

[10]   Let $\theta = \frac{\pi}{6}$.
   [a]   Find an angle with positive measure that is co-terminal with θ.
   [b]   Find an angle with negative measure that is co-terminal with θ.
   [c]   Find 3 angles between 0 and 2π that have θ as their reference angle.

[11]   State the following trigonometric identities.
   [a]   the 3 Pythagorean identities that involve the 6 trigonometric functions
   [b]   the co-function identities for each of the 6 trigonometric functions
   [c]   the double angle identities for $\cos 2x$ (3 versions) and $\sin 2x$

[12]   Simplify $\sin(x - \pi)$.

[13]   Simplify $\cos(2\pi - x)$.

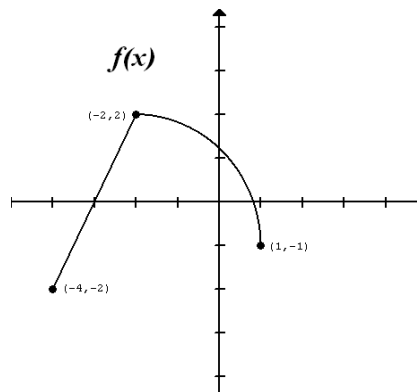[14]   Find all solutions of $1 + 2\cos x = 0$, where $0 \le x \le 2\pi$.

[15]   Find all solutions of $\sin 2x = -\frac{\sqrt{3}}{2}$.

[16]   Sketch the general shape and position of the following graphs. Do not worry about specific $x-$ and $y-$ coordinates.

$y = x^5$ $y = x^{-4}$ $y = x^{\frac{1}{3}}$

$y = e^x$ $y = 0.5^x$

$y = \ln x$ $y = \log_{0.4} x$

$y = \cos x$ $y = \tan x$ $y = \csc x$

$y = \sin^{-1} x$ $y = \cos^{-1} x$ $y = \tan^{-1} x$

[17]   The graph of $f(x)$ is shown on the right. Sketch the following graphs.

$y = f(x) - 2$

$y = f(x + 2)$

$y = f(2x)$

$y = 2f(x)$

$y = f(-x)$

$y = -f(x)$

[18]   Determine algebraically if $f(x) = x\sqrt{1 + x^2}$ is symmetric about the $y-$ axis, about the origin or neither.

[19]   Determine algebraically if $f(x) = \sin x - \cos x$ is even, odd or neither.