Math Summer Assignment for

Calculus Honors

Wall Township Math Department
Optional Summer Assignment

★ This summer assignment is intended to prepare you for the math course above.
★ You will find examples and video links to help you complete the practice.

Skill 1: Evaluating Trig Ratios

Helpful Video Link:
➜ [Unit Circle Trigonometry - Sin Cos Tan - Radians & Degrees](#)

Practice: Evaluate the following trigonometric ratios.

1)	$2cos\left(\frac{3\pi}{4}\right)$	2)	$tan\left(\frac{7\pi}{6}\right)$
3)	$csc\left(\frac{-3\pi}{2}\right)$	4)	$sec(\pi)$
5)	$sin\left(\frac{\pi}{6}\right) \cdot cos\left(\frac{\pi}{3}\right)$	6)	$cos(0) \cdot tan\left(\frac{-\pi}{4}\right) + sin\left(\frac{-3\pi}{4}\right)$

Skill 2: Solving Trig Equations

Take a look...

Helpful Video Link:
 → Solving Trigonometric Equations Using Identities, Multiple Angles, By Factoring, General Solution

Practice: Solve each of the following for angle θ, where $0 \leq \theta \leq 2\pi$

1)	$cos\theta = 1$	2)	$csc\theta = 2$
3)	$sin\theta = -\frac{\sqrt{2}}{2}$	4)	$cos^2\theta = \frac{3}{4}$
5)	$tan2\theta - \sqrt{3} = 0$	6)	$2sin^2\theta - 2sin\theta + 1 = 0$

Skill 3: Functions

Practice:

If $h(t) = t^2 + 2t - 5$, find					
1)	$h(1)$	2)	$h\left(\frac{3}{2}\right)$	3)	$h(x + h)$
4)	$- h(x)$	5)	$h(2x)$	6)	$h(x + h) - h(x)$

7) Find the values of $p(3)$ and $p(-4)$, if they exist. If a value does not exist, explain why it does not.

$$p(x) = \begin{cases} -2|x + 6| + 7, & -8 \le x < -3 \\ \frac{1}{3}x - 2, & -3 < x \le 3 \\ (x - 5)^2 - 5, & 3 < x < 8 \end{cases}$$

8) Write the equation of a line that passes through $(4, 1)$ and $(-1, 1)$ in point slope form.

9) Find the equation of the line perpendicular to the line you found in #8 that passes through $(4, 1)$.

Skill 4: Points of Discontinuity and Extrema

Practice:

1) Identify the interval(s) where the graph is...	
... increasing	
... decreasing	
... constant	
Now, identify any points of discontinuity.	
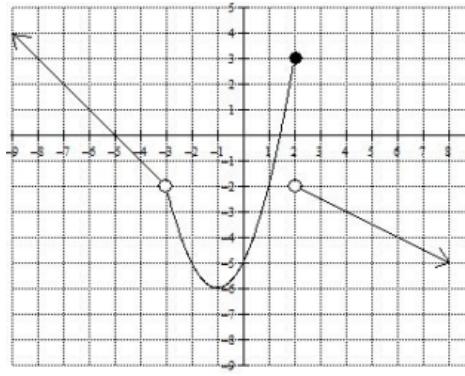
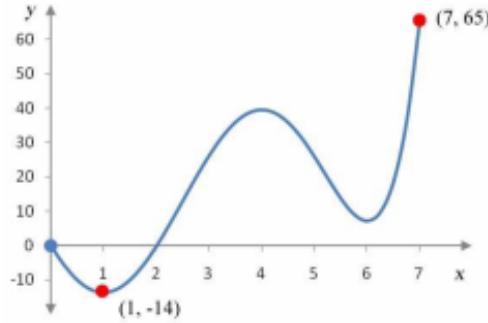| 2) Identify the following...	
... all local minima.	
... all local maxima.	
... any absolute minima.	
... any absolute maxima.	
... all zeros.	

3) If $f(x) = \frac{(4x-3)(x-2)}{2(x+3)(x-2)}$, identify the following...

... any vertical asymptotes, if they exist
... any horizontal asymptotes, if they exist
... the coordinate(s) of any hole that exists
... domain

4) If $f(x) = \frac{2}{x-3}$ and $g(x) = \frac{x-2}{x^2-9}$, identify the value(s) of x will the graphs of $f(x)$ and $g(x)$ have discontinuities.

Skill 5: Factoring

Helpful Video Link:
→ [Factoring]

Practice: Factor each of the following polynomials

1)	$f(x) = 5x^3 - 2x$	2)	$g(x) = 3x^3 - 3x^2 - 18x$	3)	$h(x) = x^4 - 10x^2 + 9$
4)	$p(x) = x^3 + 2x^2 - 4x - 8$	5)	$q(x) = 2x^3 + 3x^2 - 8x - 12$	5)	$r(x) = 4x^3 + 16x^2 + 16x$