Honors Pre-Calculus Summer Review Packet

For the school year starting Fall 2019

Your name: _____

Honors Pre-Calculus is a very fast paced, rigorous course intended to prepare students to take college level calculus the following year. The topics in this packet are considered prerequisite skills and will not be reviewed during the course. It is imperative that you are comfortable with all of these types of problems before the first day of class.

To help you be successful with this packet, we have created an EdPuzzle class with videos that will help you refresh the topics. These videos are not meant to teach you new material, but to help you remember what has been taught in previous courses. To access the class, go to EdPuzzle.com and log in using your school google account. Click on "join a class" then enter the following code: **kezzolt** Once you are in, don't forget to press "load more" so that you can see all of the videos. These videos are not required, but just meant to help you in case you are having trouble completing some sections of this packet.

In general, you must know how to do all these problems WITHOUT a calculator (there is one exception in problem 10 as noted). You should also know the difference between a rounded value and an exact value. All answers in this packet (and in the course) should be answered exactly. For example you should write π, not 3.14, 1/3 not .3333 and $\sqrt{5}$, not 2.236. All fractions and radicals should be in simplest form and should be left as improper fractions, not mixed fractions.

Rules for the packet: You may collaborate with others, look things up on google, consult old notes, textbooks, etc., but all of your work on this packet must be your own. You know the difference between working together and copying. Do your own work! This packet has been developed so that you should be able to do the problems without the help of a tutor, using what you've learned in past courses. If you must rely on a tutor to complete this packet of prerequisite skills, then we should discuss your appropriate math placement. We want you to enroll in a math course where you will be successful. Not having a solid math foundation will make Honors Pre-Calculus incredibly difficult, if not impossible.

How will this packet be graded?
- You will have a quiz on the concepts included in these problems at the end of the first week of school.

- This packet is due on the day of the quiz and will count as a homework grade.

Not doing this packet means you will not be prepared for the first quiz and you will get a zero for this homework assignment. You will also be behind before the course even starts. Remember, we are assigning this packet to make sure everyone has the skills they need to be successful in a very difficult course. We want you to succeed.

1. **Solving algebraic equations**. Solve for the unknown variable.

a) $2a - 3 = 12$

b) $3 - (4x - 5) = 6x - 2$

c) $4(x - 2) - 6(2x + 1) = -2(3 - x)$

2. **Part 1: Solve** the following quadratic equations by **factoring**.

a) $x^2 - 4x - 5 = 0$	b) $x^2 + 2x + 1 = 0$	c) $3x^2 + 10x - 8 = 0$
d) $6x^2 - 5x = 4$	e) $2x^2 + x - 3 = 0$	f) $2x^3 + 3x^2 - 2x - 3 = 0$

#2, Part 2: Solve the following quadratic equations by **completing the square**, or **quadratic formula**.

g) $x^2 + 2x - 5 = 0$	h) $x^2 + x = 5$	i) $3x^2 - 5x - 1 = 0$

3. **Operations with rational functions**:
   Write each of the following as a single, simplified rational expression. State all domain restrictions.

a) $\dfrac{1}{x} + \dfrac{1}{y} =$	b) $\dfrac{1}{(x-1)} - \dfrac{1}{(x+1)} =$	c) $\dfrac{(3m-9)}{8m} \cdot \dfrac{(16m+24)}{15} =$

4. **Solving rational functions**:

Solve each rational function. Be sure to identify any extraneous solutions.

a) $\dfrac{-2}{x-1} = \dfrac{x-8}{x+1}$

b) $\dfrac{3x}{x-2} + \dfrac{1}{x+2} = \dfrac{-4}{x^2-4}$

c) $\dfrac{3x}{x-2} - 1 = \dfrac{6}{x-2}$

5. **Simplify the complex fraction**:

d) $\dfrac{1 + \dfrac{9}{16}}{1 - \dfrac{3}{4}} =$

e) $\dfrac{x + \dfrac{x}{y}}{1 + \dfrac{1}{y}} =$

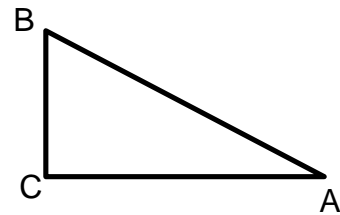f) $\dfrac{\dfrac{1}{x^2} - \dfrac{1}{y^2}}{\dfrac{1}{xy}} =$

g) $\dfrac{\dfrac{a^2+b^2}{ab}+2}{\dfrac{a^2-b^2}{2ab}} =$	h) $\dfrac{\dfrac{t}{p}+1}{\dfrac{t}{p}-1} =$	i) $\dfrac{1-\dfrac{9}{x^2}}{\dfrac{1}{x}-\dfrac{3}{x^2}} =$

6. **Pythagorean Theorem.** Given right triangle ABC, with a right angle C, show the work to…

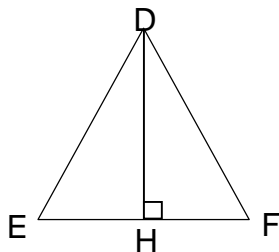a) Find AB if AC = 6 and BC = 8

b) Find AC if BC = 5 and AB =6

c) Find AB if AC = $5\sqrt{3}$ and BC = 5

7. **Special right triangles**:

a. Given $\triangle$PRS , with a right angle P, $\angle R = 45°$ and SR = 6 then PS =?

b. DEF is an equilateral triangle. If EH = 1, find DE and DH.

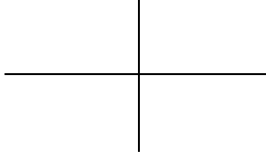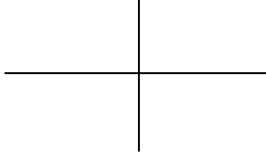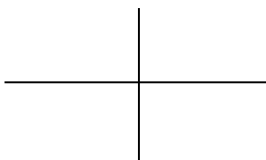**Simplify** the following **radicals** then **add/ subtract the fractions**:

a) $\dfrac{\sqrt{3}}{2} + \sqrt{12} - \dfrac{\sqrt{75}}{3}$

b) $\dfrac{\sqrt{24}}{4} - \dfrac{\sqrt{54}}{12}$

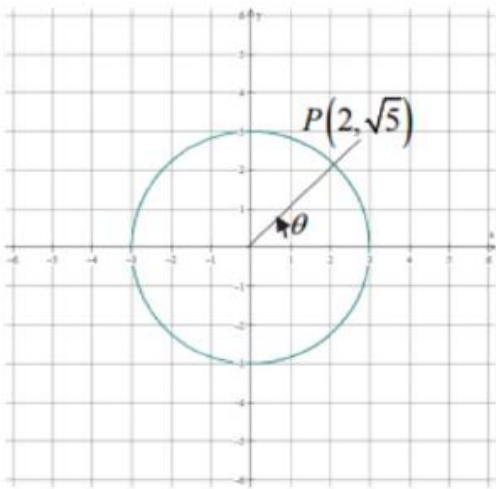8. **Divide polynomials using long division**. Write the remainder as a fraction.

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

9. **Trigonometry:** Fill in the missing values for sinθ or cosθ given the other data in the chart.

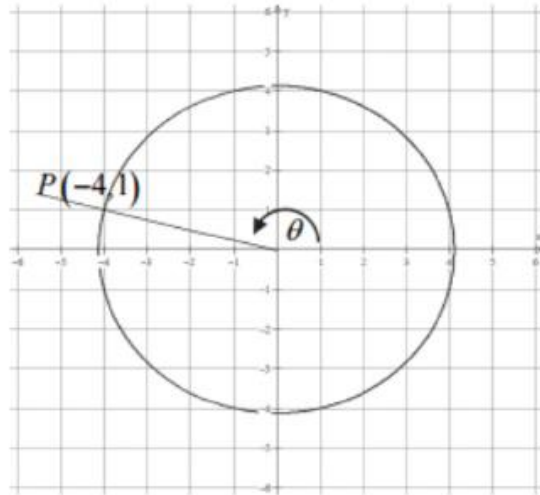|				Draw triangle in correct quadrant, label sides according to the value of the trig function:
1.	$\cos\theta = \dfrac{3}{5}$	$\sin\theta =$	θ is in Quadrant I	
2.	$\cos\theta =$	$\sin\theta = -\dfrac{7}{25}$	θ is in Quadrant III	
3.	$\cos\theta = -\dfrac{5}{13}$	$\sin\theta =$	θ is in Quadrant II	

10. **Trigonometry:** In each part below, a circle centered at the origin is shown, with an angle θ. For each figure, determine $sin\theta$, $cos\theta$, and $tan\theta$ as an exact value (no decimals, leave simplified radicals and fractions as your answers), as you did in problem #11. Also, find the measure of the angle to the nearest tenth of a degree.
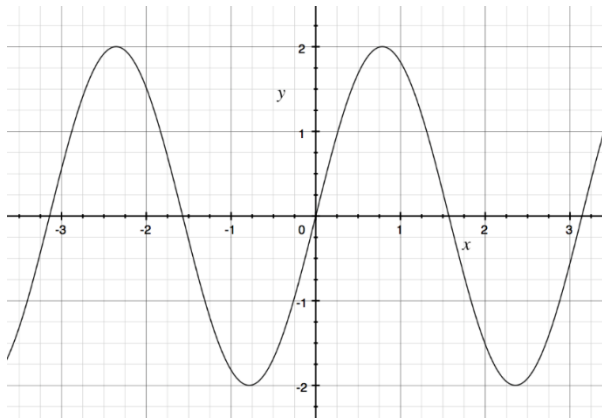
a.

$P\left(2, \sqrt{5}\right)$

θ

b.

$P(-4, 1)$

θ

$sin\theta =$	$sin\theta =$
$cos\theta =$	$cos\theta =$
$tan\theta =$	$tan\theta =$
$\theta=$	$\theta=$

*Use a calculator to find θ

11. **a) Find the trig equations given the graph**. A sine and a cosine function that could each represent the graph given below.
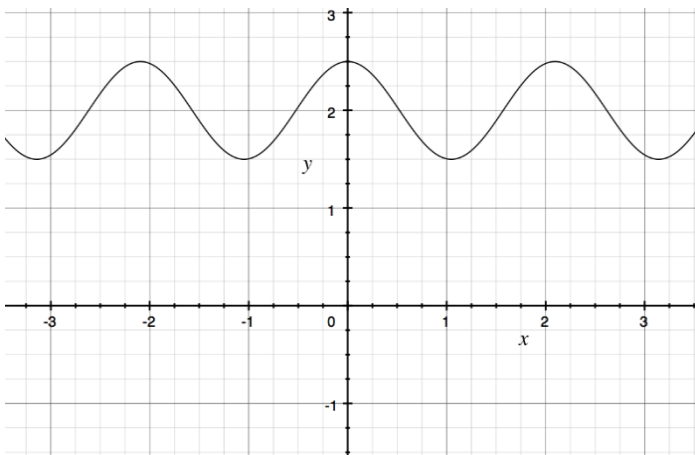

Amplitude: _____   Period: _____

Sine function: _____

Cosine function: _____

b) Find the trig equations given the graph. A sine and a cosine function that could each represent the graph given below.

Amplitude: _____   Period: _____

Sine function: _____

Cosine function: _____

Use this space to give comments and / or concerns about the packet, the class, etc. for your teacher to see.