

Honors Calculus with Applications

Summer Review Packet for the school year starting Fall 2019

Your name: _____

Calculus with Applications is an honors math course. If you have never taken an honors math course, you may find this to be a difficult class. We don't move as quickly as a college (or AP) course, but it is still calculus. In order to be able to do any type of calculus, you need to have strong algebra and pre-calculus skills. The problems in this packet are designed to help you prepare for calculus with applications next year.

To help you be successful with this packet, I 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 the past 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: **ceroujv** 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 the event that you forgot some of these topics and need a refresher while working on the packet.

In general, you need know how to do all these problems using only a 4 function a calculator. 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.

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 be placed in the math course where you will be most successful and not having a solid math foundation will make Honors Calculus incredibly difficult.

How will this packet be graded?

- The first chapter in Honors Calculus is college Algebra and there will be a quiz the first week of class.
- This packet is due on the day of the quiz and will count as a very large homework grade.

Not doing this packet means you will not be prepared for the first quiz and you will get a zero for this as homework. I am assigning this packet to make sure everyone has the skills they need to be successful in a difficult course. **I 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. **Solve** the following quadratic equations by **factoring**, **completing the square**, or **quadratic formula**.

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

3. **Factor out the greatest factor:** Leave each problem in the simplest factored form.

a) $2x^2 + 4x$	b) $12a^3bc^3 - 18ab^2c^3$	c) $2(x-1)(x+2)+6(x-1)(x+3)$
d) $25(x-3)^2(x+2)^2-10(x-3)^3(x+2)$	e) $4x^{\frac{1}{2}} + 20x^{\frac{3}{2}}$	f) $x^2y^{\frac{1}{3}} + x^3y^{\frac{4}{3}}$

4. **Solving rational functions:** Solve each rational function. Be sure to identify any extraneous solutions.

a) $\frac{-2}{x-1} = \frac{x-8}{x+1}$	b) $\frac{3x}{x-2} + \frac{1}{x+2} = \frac{-4}{x^2-4}$	c) $\frac{3x}{x-2} - 1 = \frac{6}{x-2}$
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5. Simplify the complex fraction:

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

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

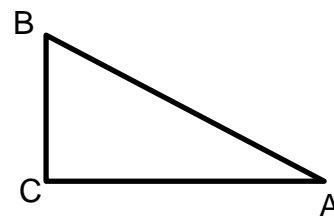
f) $\frac{1 - \frac{9}{x^2}}{\frac{1}{x} - \frac{3}{x^2}} =$

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

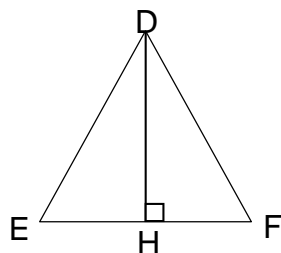
c) Find AB if AC = $5\sqrt{3}$ and BC = 5



7. **Special right triangles:**

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

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



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

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

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




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

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

10. **Divide polynomials using synthetic division.** Write the remainder as a fraction.

$$(x^3 - 2x^2 + 3x - 1) \div (x - 2)$$

11. **Trigonometry:** Fill in the missing values for $\sin\theta$ or $\cos\theta$ given the other data in the chart.

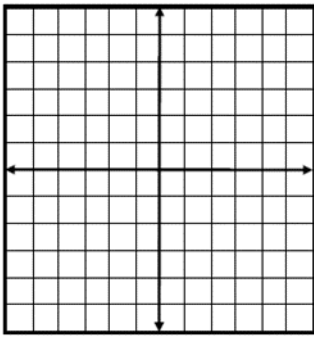
1.	$\cos \theta = \frac{3}{5}$	$\sin \theta =$	θ is in Quadrant I	Draw triangle in correct quadrant, label sides according to the value of the trig function: 
2.	$\cos \theta =$	$\sin \theta = -\frac{7}{25}$	θ is in Quadrant III	
3.	$\cos \theta = -\frac{5}{13}$	$\sin \theta =$	θ is in Quadrant II	

12. **Solving Trigonometric Equations:** Solve each equation for θ . Give all answers in radians between $[0, 2\pi)$

a) $2 \cos \theta + \sqrt{3} = 0$	b) $\tan \theta = 3 \tan \theta + 2$	c) $\sin 2x - \cos x = 0$
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13. **Parent Functions** and transformations. Graph each function without using a calculator. Clearly show at least 3 pts for each function and write Domain & Range in interval notation.

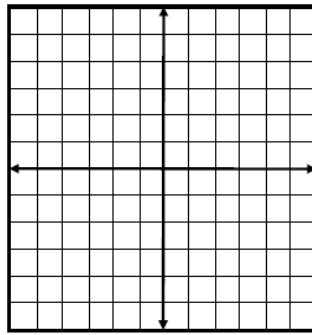
a) $y = x^2$



Domain:

Range:

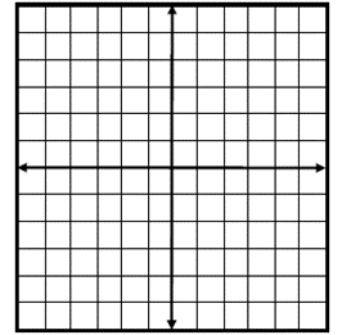
b) $y = (x - 2)^2$



Domain:

Range:

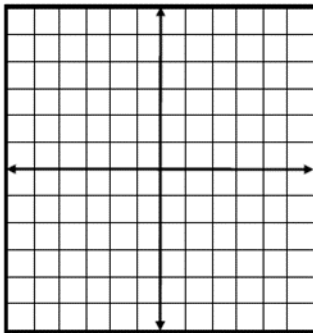
c) $y = x^2 + 3$



Domain:

Range:

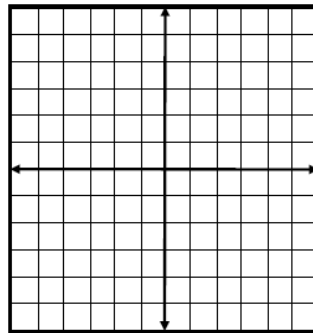
d) $y = \sqrt{x}$



Domain:

Range:

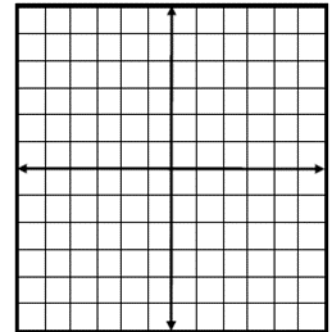
e) $y = \sqrt{x} - 2$



Domain:

Range:

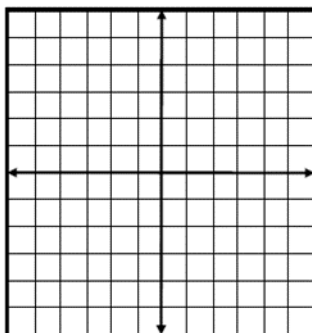
f) $y = \sqrt{x + 1}$



Domain:

Range:

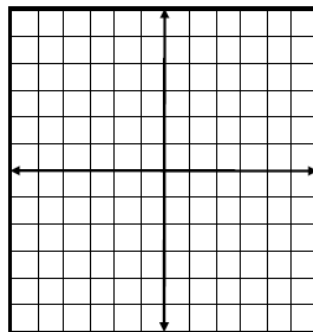
g) $y = \frac{1}{x}$



Domain:

Range:

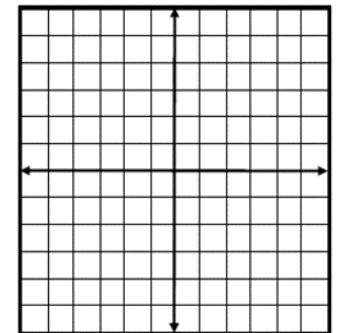
h) $y = \frac{1}{x+2}$



Domain:

Range:

i) $y = \frac{1}{x} + 3$



Domain:

Range:

14. **Write the equation of a line** given the following information. Equations can be in point slope, or slope intercept form.

a) Slope of -2 & contains the point (-2,5)	b) Contains the points (-11, 5) & (7, 3)	c) Slope of 0 & contains the point (-12, 6)
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15. **Operations with Exponents.** Simplify the following expression; assume no variable is equal to zero. Final answer shouldn't have any negative exponents.

a) $(2x^4)^{-3}$	b) $\frac{5x^4y^2z}{30x^2yz^3}$	c) $(8x^6y^{\frac{3}{2}})^{\frac{1}{3}}$	d) $\frac{6x^{\frac{4}{5}}y^{\frac{2}{3}}}{\frac{1}{2x^{10}y}}$	e) $(x-1)^2$
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