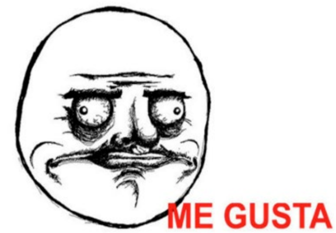


All work must be clear, NO WORK NO CREDIT

TIPS for Calculus AB:
DO THE HOMEWORK. It helps.
DON'T GIVE UP. If you're willing to try, we are willing to help ☺

Show all work to receive credit.

Factoring

1) $x^2 + 4x + 3$

ANSWER:

2) $12x^3y - 75xy^3$

ANSWER:

3) $x^3 + 8$

ANSWER:

4) $x^3 - x^2 + 2x - 2$

ANSWER:

5) $u^3 + 27v^3$

ANSWER:

6) $\sec^4 x - \tan^4 x$

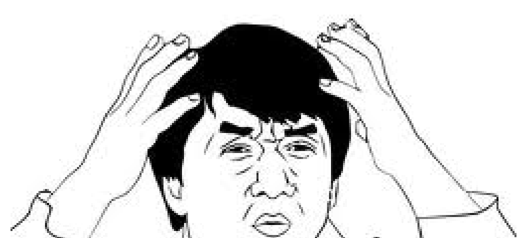
ANSWER:

7) $(\sin^4 x - \cos^4 x) / (\sin^2 x - \cos^2 x)$

ANSWER:

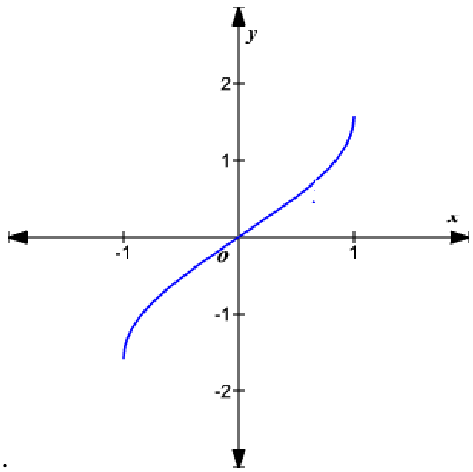
8) $\sin^2 x + \cot^2 x \sin^2 x$

ANSWER:

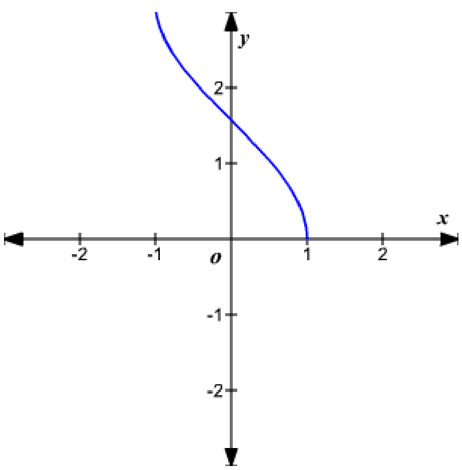


Library of Functions

Match the graph with its equation

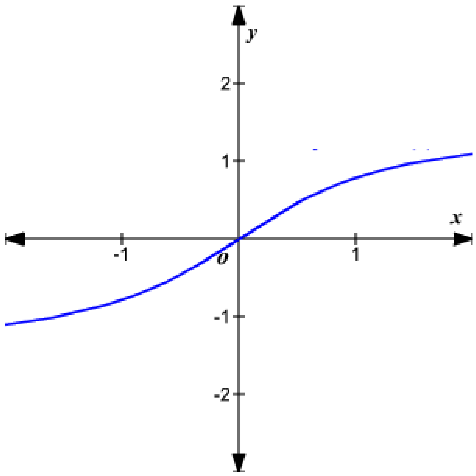


1.



2.

A. Y= arccos(x)
B. Y= arctan(x)
C. Y= arcsin (x)

3. 

4. Find the equation of the line passing through (-2, 5)

   a. Parallel to 3x-5y = 7

   b. Perpendicular to 3x-5y = 7

5. Find the domain

a: $\dfrac{(x+3)(x+2)}{(x-4)(x+1)}$ **b:** $f(x)=\dfrac{x^2-25}{x+5}$ **c:** $f(x)=\dfrac{(x^2-4)(x-3)}{x^2-x-6}$

a.

d: $f(x)=\begin{cases} 9-x^2 & x\neq -3 \\ 10 & x=-3 \end{cases}$ **e:** $f(x)=\lfloor x \rfloor$ ($\lfloor x \rfloor$ means the greatest integer less than or equal to x)

f: $f(x)=3\lfloor 2x \rfloor$ **g:** $f(x)=\begin{cases} x+3\ , x<-5 \\ \sqrt{25-x^2}\ , -5\leq x\leq 5 \\ 3-x,\ x>5 \end{cases}$ **h.** $f(x)=\lfloor x-4 \rfloor$

a.__________________
b.__________________
c.__________________
d.__________________
e.__________________
f.__________________
g.__________________
h.__________________

6. State if the function is even or odd?

a. Y = sin(x)
b. Y= sec(x)
c. Y = tan(x)

7.

Is $\left\{(x, y): y=\sqrt{4-x^2}\right\}$ a function and if so, what is its domain?

8.

Given $F(x)=\sqrt{x+9}$ find and simplify $\dfrac{F(x+h)-F(x)}{h}, h \neq 0$

9. Find the period of y = 5sin (2x + 4)

10.

If $f(x)=\dfrac{x+1}{x-1}$ *and* $g(x)=\dfrac{1}{x}$, write a **formula** for and give the **domain** of:

a: $f \cdot g$ b: $f \circ g$ c: $f \circ f$

11.

. Is $f(x)=\dfrac{x^2-5}{2x^3+x}$ even, odd or neither? Prove analytically (**NOT** graphically).

Trigonometry

Draw a representation of a unit circle. Draw a coordinate system with the origin at the center of the circle using a straight edge. Draw, all angles that are multiples of $\pi/6$, $\pi/4$, $\pi/3$, and $\pi/2$ radians going once around the circle in standard position. For each angle Θ, state the first two positive and first two negative values of Θ having that terminal side along with the $\sin \Theta$, $\cos \Theta$, $\tan \Theta$, and $\sec \Theta$.

Example: $\Theta = \pi/6, 13\pi/6, -11\pi/6$ $\sin \Theta = ½$, $\cos \Theta=$….

This should be done carefully and from memory. Do not look these up! These need to be part of your general knowledge for this year!

1.

The surface area of a sphere is given by: $A = 4\pi r^2$. Suppose a balloon maintains the shape of a sphere as it is being inflated so that the radius is changing at the constant rate of 3 cm per second. If f(t) centimeters is the radius of the balloon after t seconds:

a: Compute $(A \circ f)(t)$ and interpret the result (what does it tell you?)

b: Find the surface area of the balloon after 4 seconds using $(A \circ f)(t)$.

Find the correct answer.

2. Sin $(3\pi/4 + 5\pi/6)$ =

3. Sin$(3\pi/4)$ + sin $5\pi/4$ =

Find all solutions in the interval $[0,2\pi)$

4. $\sin^2(x) + 2\cos(x) = 2$

5. $3\csc^2(5x) = -4$

6. $2\cos^2(x) + 3\cos(x) = 0$

Solve the equation:

1. $4\cos(\theta) = 1 + 2\cos(\theta)$

2. $4\tan^2(u) - 1 = \tan^2(u)$

3. $2\sin^2(x) - \sin(x) - 1 = 0$

4. $\text{Cot}(x)\cos^2(x) = 2\cot(X)$

5. $2\cos(3x-1) = 0$

Simplify:

1. $\frac{\sqrt{x}}{x}$
2. $e^{\ln 3}$
3. $e^{(1+\ln x)}$
4. $\ln 1$
5. $\ln e^7$
6. $\log_3(1/3)$
7. $\log_{1/2} 8$
8. $\ln\frac{1}{2}$
9. $e^{3\ln x}$
10. $\frac{4xy^{-2}}{12x^{-\frac{1}{3}}y^{-5}}$
11. $27^{2/3}$
12. $(5a^{2/3})(4a^{3/2})$
13. $(4a^{5/3})^{3/2}$
14. $\frac{3(n+2)!}{5n!}$ [NOTE: $5n! \neq (5n)!$]

<u>Solve for x, where x is a real number. Show the work that leads to your solution.</u>

1. $x^2 + 3x - 4 = 14$
2. $\frac{x^4 - 1}{x^3} = 0$
3. $(x - 5)^2 = 9$
4. $2x^2 + 5x = 8$
5. $(x + 3)(x - 3) > 0$
6. $x^2 - 2x - 15 \leq 0$
7. $(x + 1)^2(x - 2) + (x + 1)(x - 2)^2 = 0$
8. $(x-2)(x+3)^7(x-14)^{18}(x+11)^{29}(x)^{34} > 0$
9. $27^{2x} = 9^{x-3}$
10. $\log x + \log(x - 3) = 1$
11. $e^{3x} = 5$
12. $\ln y = 2x - 3$

Find the phase shift of the following equation: $y = -3\sin(4x - \frac{\pi}{3}) - 1$

For all x, how many of the following statements can sufficiently prove that two functions $f(x)$ and $g(x)$ are inverses of each other?

I. $f(g(x)) = x$

II. $f(x) = \dfrac{1}{g(x)}$

III. $f(x)$ passes the vertical line test.

IV. $f(x)$ passes the horizontal line test.

Summer Packet AP AB Calculus

Equations

1. State the symmetry of the relation $y^2 = x^2 + x$?

2. Find the equation of a line passing through (-3,4) and whose slope is orthogonal to the function $y = \frac{1}{2}x + 10$.

3. What are the roots of the following equation $y = 3^x - 0.5$?

4. What are the zeroes of the equation f(x)= $(x+1)^4(x-2)^3(x-3)^2(x+4)$?

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Classify the conic section and write its equation in standard form.

1) $y^2 - 12y + 4x + 4 = 0$

2) $-9x^2 + 4y^2 - 36x - 16y - 164 = 0$

3) $x^2 + y^2 + 12x - 12y + 36 = 0$

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1. True or False?
   a. When power functions are odd they have y-axis symmetry.
   b. Greatest integer functions have a range of all real numbers.
   c. Y= sin x has an origin symmetry.
   d. Power functions are always even.

1. Given that $f(x) = f(-x)$. Determine what kind of symmetry the graph possesses.

2. Find the domain and range of the graph of $f(x)=\sqrt{16-x^2}$.

Find all Real solutions for x: **Show work in the rectangles below**:

1. $\frac{3}{x+2} - \frac{1}{x} = \frac{1}{5x}$

2. Cos x = ½

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3. $\frac{x}{x-2}+\frac{1}{x-4}=\frac{2}{x^2-6x+8}$

4. $\frac{10}{x+4}=\frac{15}{4(x+1)}$

5. $\frac{x-4}{4}+\frac{x}{3}=6$

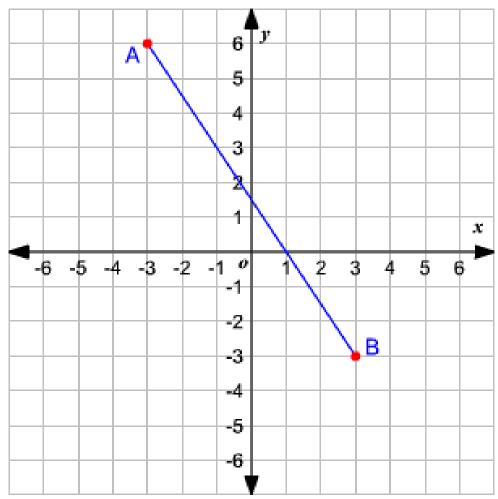
Summer Packet AP AB Calculus

Distance Formula, Midpoint Formula, and Equations of Lines:

Directions: Choose the best answer for each problem. Show all your work to receive credit! Round answers to three decimal places. Write final answer on the line provided.

1) Find the distance in between the points (3,7) and (5,2). ____________________

2) Calculate the distance from point *A* to point *B* and the rate of change. ____________________



____

3) Find the distance between the given pair of points. Express your answer in the simplest radical form and in decimal form.

$$\left(\frac{5}{6}, -2\right)\left(3, -\frac{1}{3}\right)$$

____

4) Find the midpoint of the line segment with the given endpoints.

(-4, 4), (5, -1)

____

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5) Find the coordinates of the midpoint of the segment joining the given points.

   (x, 2) and (x+4, -4)

   ____

6) Write an equation of a line for the following points in point slope:

   (-4, 3) and (2, 3)

   ____

7) Write an equation of a line that is parallel to the line created by (2 , 4) and (-4 , 3) and passes through the point (10, -2).

   ____

8) Write an equation of a line that is perpendicular to the line created by (0 , 7) and (0 , 8) and passes through the point (2, 5).

   ____

9) Write an equation of a line that is perpendicular to the line Y=2x - 4 and passes through the point (-6,5).

   ____

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WORD PROBLEMS

Show all work below each of the problems

1. If a Pokéball is projected upward from ground level with an initial velocity of 32 feet per second, unleashing Lugia, then its height is a function of time, given by s= $-16t^2 + 32t$. What is the maximum height reached by the Pokéball?

2. A large Magikarp is 169 ft tall. One day at noon is casts a 225 ft shadow. What is the sun's angle of elevation at that time?

State the formula for each of these (by memory if possible), look them up otherwise. Memorize and know by the first day of class, you will need them throughout the year.

1. $\sin(A+B) =$
2. $\cos(A+B) =$
3. $\sin 2A =$ Show the derivation of this from #1 and/or #2, be CLEAR
4. $\cos 2A =$ $=$ $=$ (3 forms) Show the derivations from #1 and/or #2
5. $\sin(\frac{1}{2}A)$ Show the derivation from #4, be CLEAR
6. $\cos(\frac{1}{2}A) =$ Show the derivation from #4, be CLEAR