AP CALCULUS SUMMER WORK

2025-2026

Mrs. Bannon

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For a student to successfully complete the objectives of the AP Calculus curriculum, the student must demonstrate a high level of independence, capability, dedication, and effort. This summer packet is intended to help you maintain/improve your skills. This packet is a requirement for those entering the AP Calculus course. There will be deadlines throughout the summer to avoid having you wait until the week of school starting to complete this work. The packet should be turned in on the first day of class. Please see the other deadlines for check in points throughout the summer. If it is not completed on the first day of class, you should consider yourself behind not only on your class grade, but also on the concepts necessary for success in Calculus. Complete as much of this packet on your own as you can first, then get together with a friend, or "google" the topic. You will be taking a test on the summer work during your second class (TBD based on the schedule for next year).

The *following are guidelines for* completing the summer *packet*:

- ✓ You must show all work on the packet.
- ✓ Be sure all problems are neatly organized and writing is legible.
- ✔ In the event that you are unsure how to perform functions on your calculator, you may need to look up the necessary syntax or keystrokes. You can certainly find these online. You must be familiar with certain built-in calculator functions such as finding values, intersection points, using tables, and finding zeros of a function.
- ✓ I expect you to come in with certain understandings that are prerequisite to Calculus. These topics are covered in this packet.

Finally, I suggest not waiting until the last two weeks of summer to begin on this packet. If you spread it out, you will most likely retain the information much better. Once again this is due,

completed with quality, on the first day of class. It is your ticket into the class. Best of luck and if you questions, feel free to contact me at bannonl@gilbertschool.org.

Important Dates:

Packet Due: Wednesday August 27th, 2025

Summer Work **Test**: Tuesday/Wednesday September 2nd or 3rd, 2025

Google Classroom Code:

2gurkrit

Khan Academy Classroom Code: T3B3JRNT

have

JUST

J

d

u

any

IT

***There is also a Khan Academy Assignment posted to Google Classroom. This assignment reviews skills necessary to be successful with our first topic: Limits.
The Khan **Academy** Assignment **will be** due Friday **August 1**, 2025 at 11:59
PM.

Materials Needed for Class:

Textbook: Rogawski's Calculus for AP* 2nd Edition Early Transcendentals

(you will each receive a copy of this to check out of the school library)

Graphing Calculator: TI-84 Plus or better

3-Ring Binder and 1 subject Notebook

AP Calculus Summer Work: Concept Strategies

PART I: **Pre**-Calculus

This is the first part to a seven part set of strategies to help you identify what the question is

asking you to do on the AP test. I suggest you create flashcards of these 7 Pre-Calculus Strategies. You should be able to explain the process that needs to be completed (This is what you think of doing) when you see the words in column one. You will be creating more of these throughout the school year. It is suggested to get a ring to keep all of these flashcards together! You will be adding to this **set** of flashcards and refer back to these all year long. It will be a useful tool to have to study **for** the AP test.

When you see these words . . .	This is what you think of doing.
Find the zeros off(x).	Set function equal to 0. Factor or use quadratic equation if quadratic. Graph to find zeros on calculator.
Find the intersection of f(x) and g(x).	Set the two functions equal to each other. Find intersection on calculator.
Show that f(x) is even.	Show that f (-x) = f (x). This shows that the graph of f is symmetric to the y-axis.
Show that f(x) is odd.	Show that f (-x) = - f (x). This shows that the graph of f is symmetric to the origin
Find domain of f(x).	
Find vertical asymptotes off(x).	
If a continuous function f (x) has f (a) <k and f (b) > k, explain why there must be a value c such that a <c<b and f (c) = k.	

Assume domain is (- ∞, ∞). Restrict domains: denominators#0, square roots of only non-negative numbers, logarithm or natural log of only positive numbers.

Express f (x) as a fraction, express numerator and denominator in factored form, and do any cancellations. Set denominator equal to 0. This is the Intermediate Value Theorem.

TRIGONOMETRY

Trig **Functions**

sinf

Things to Know for Calculus

opp

adj

cos

tan *0*

hyp

hy

p

opp

adj

Reciprocal Functions

1

hyp

1

CSC *0*

sec *b*

sin

opp

COS *O*

hyp

adj

cot *0*

1

tan *0*

adj

opp

SOH-CAH-TOA

hypotenuse

opposit
e

0

adjacent

TEST ONLY **USES RADIANS**!

Must know trig values of special angles
On,

UNIT CIRCLE

4

3π

π, *2π* using Unit Circle or Special Right Triangles.

2

(−,
+)

π

(-1, 0)

K
I
N

2

(0,1); (3)

90°

60°

3 2

45°

30

6)

2 2

cos sin

(+,+)

To help remember the signs in each quadrant

All Students Take Calculus

(+

−)

(−, −)

3π

2

(0, -1)

0° Oπ

360° 2π

(1,0)

(+-)

(,)

(+,+)

II

I

Sin positive **(csc)**

All positive

Tan positive (cot)

Cos positive
(sec)

IV

(+)

SPECIAL RIGHT TRIANGLES

30° 60°-90° Triangles

Which are

-품-풀

Triangles

45° - 45° – 90° Triangles

Which are Triangles

2

60°

30%

3

Find tan

tan (simplify to

1 v3 V3

√3

13

3

4594

1

Find sin

sin () == simplify to

opp

hyp

1

Graphs **of trig** functions

y = sin *x*

J

A

y = tan x

y = cos *x*

Inverse Trig Function

sin−10 is the same as arcsin

sin-10 =

means what angle has a sine value of 2

that means = ±2π*n* or + 2π*n*

Since has infinite answers then it isn't a function. Bummer. To make it a function we define inverses like:

sin/csc and tan/cot use quadrant I and IV for inverses cos/sec use quadrant I and II for inverses

So... *0*

because it is in the first quadrant

Trig **Identities**

There are a bunch, but you really only need to know Pythagorean Identity. **sin2x** + **cos2x** = **1**

Subtract sin2x to get cos2x = 1 − sin2x or subtract cos2x to get sin2x = 1 − cos2x

Divide by sin2x to get 1 + cot2x = csc2x or divide by cos2x to get tan2x + 1 = sec2x

GEOMETRY

FORMULAS

AREA

Triangle = bh

Circle = r^2

$\pi\gamma$

Trapezoid = (b1 + b2)h

CIRCUMFERENCE

Circle = $2\pi r$

SURFACE AREA

Sphere $4\pi\gamma^2$

LATERAL AREA

Cylinder $2\pi rh$

=

VOLUME

$\frac{4}{3}\pi r^3$

Sphere = —

$\pi y3$

3

Cylinder = r2h

1

2h

Cone = ¦¦µÃ2h

Prism

3

-

πρι

Bh

Pyramid = Bh

B is the area of the base

DISTANCE FORMULA

The distance between two points (*x1*,*y1*) and (*x2*, y2) is *d* = √ (*x2*-x1)2 + (Y2 - Y1)2

ALGEBRA

Linear Functions

Slope

m =

Ay

32–Y1

y-intercept Form

(slope-intercept Form)

Point Slope Form

Ax

X2 - X1

y = mx + *b*

y–y1 = *m*(*x* – x1)

Parallel Lines

Have the same slope

Perpendicular Lines

Have the opposite reciprocal

slopes

Functions

Quadratic Function

$f(x) = x2$

Cubic Function

$f(x) = x3$

Absolute Value

$f(x) = x[$

Square Root Function

$f(x) = \sqrt{x}$

Exponential Function

$f(x) = bx,\ b > 1$

$y = a\,(x - h)2 + k$

Exponential Function

$f(x) = bx,\ b < 1$

$y = a(x - h)3 + k$

Logarithmic Function

$f(x) = \log,\ x,\ b > 1$

$y = ax - h + k$

$y = a\sqrt{x - h} + k$

$y = a \cdot b\ (x\text{-}h) + k$

Logarithmic Function

$f(x) = \log,\ x,\ b < 1$

$f(x)$

Greatest Integer

$f(x) = [x]$

Rational Function

$f(x) = \frac{1}{x}$

1 2 3 4

-3

$y = a \cdot b(x - h) + k$

$y = a \log(xh) + k$

$y = a \log(x - h) + k$

$y = a[x - h] + k$

$y = a + k$

Translations

$x - h$

All functions move the same way!

Given the parent function $y = x2$

Move up 4

Move down 3

$y = x2 + 4$

$y = x2 - 3$

Move left 2

$y = (x + 2)2$

Move right 1

$y = (x - 1)2$

To flip (reflect) the function vertically $y = -x2$ To flip (reflect) the function horizontally $y = (-x)2$

Notation

Notice open parenthesis ( ) versus closed [ ]

Inequality	Interval
$-3 < x < 5$	(-3,5]
$-3 \leq x \leq 5$	[-3,5]
$-3 < x < 5$	(-3,5)
$-3 \leq x < 5$	[-3,5)

Even and Odd Functions

EVEN

$f(x) = f(x)$

Symmetric about the y-axis

f(x) f(x)

Even Function

Move left 2 and down 3

$y = (x + 2)2 - 3$

So $f(x) = -\sqrt{x-3}+1$ is a square root function reflected vertically, shifted right 3 and up 1

Infinity is always open parenthesis

Inequality

$x < 3$

$x < 3$ or $x > 5$

$x \quad 3$

all Real numbers

Interval

$(-\infty 0,3)$ $(-\infty, 3](5,\infty)$ $(-\infty o, 3)(3,00)$ $(-\infty 0,00)$

ODD

$f(x) = f(x)$ Symmetric about the origin

f(x) = f(x)

(-x)

f(x)

Odd Function

x

Domain and Range

Domain = all possible x values

Range all possible y values

Algebraicall
y

You can't divide by zero

You can't square root a negative

$y = \sqrt{2x+5}$

D: $[-2,\infty)$

$\infty)$

$$\frac{x2-1}{x2+7x+12}$$

D: $(-\infty,-4)(-4,-3)(-3,\infty)$

Finding zeros

Must be able to factor and use the quadratic formula: $x =$

Special products

Sum of cubes: $a3 + b3$ 3

$$(a + b)(a2 - ab + b2)$$

$$\frac{-bvb2-4ac}{2a}$$

Graphically

Just look at it

D: (-00,-1)(-1,5]

R: (-00, 2.5]

Difference of cubes: a3b3 = (*a* - *b)(a2* + *ab* + b2)

Exponential and **Logarithmic Properties**

The exponential function *b** of base *b* is one-to-one which means it has an inverse which is called the logaritmic function of base *b* or logarithm of base *b* which is denoted logь x which reads "the logarithm of base *b* of x" or "log base *b* of x". So...

BASE e

y = ex

y = lnx

y = logь *x*

x = by

KNOW!

Exponenti
al

bxby = bx+y

Product Rule

1

bx

by

bx−*y*

Quotient

Rule

Horizontal

asymptote at y
= 0

$(bx)y = bxy$

Power Rule

Logarithmic $\log_b xy = \log_b x + \log_b Y$

A

S

$\log_b \frac{x}{y} = \log_b x - \log_b Y$

$\log_b xy = y\log_b x$

b^{-x}

$\frac{1}{bx}$

$b^0 = 1$

$b^1 = b$

$\log_b \frac{x}{x} = \log_b x$

$\log_b 1 = 0$

KNOW!

$\ln 1 = 0$

$\log_b b = 1$

Change of
Base

$\log_b x = \frac{\log_e x}{\log_e b}$

Vertical

asymptote at

$x = 0$

Natural Log

Common Log

loge x = ln e

log10 x = log x

Calculus - SUMMER PACKET

Summer + Math = (Best Summer Ever)2

NAME:

NO CALCULATOR!!!

Given *f(x)* = x2 - 2x + 5, find the following.

1. *f* (-2) =

2. *f*(*x*+2)=

Use the graph *f*(*x*) to answer the following.

4. *f*(0)

f(-1) =

f(2) =

3. *f*(*x* + *h*) =

$f(4) =$

$f(x)$

$f(-2) =$

$f(3) =$

$f(x) =$

$= -3$ when $x =$?

$f(x) = 2$ when $x = ?$

Write the equation of the line meets the following conditions. Use point-slope form.

$y - y1 = m(x - x1)$

5. slope = 3 and (4, −2)

6. $m = \frac{3}{7}$ and $f(-5) =$

7. $f(4) = -8$ and $f(-3) = 12$

Write the equation of the tangent line in point slope form. $y - y1 = m(x - x1)$

8. The line tangent to $f(x)$ at $x = 1$

7 a

[f(x
)

Tangent line

9. The line tangent to $f(x)$ at $x = -2$

$f(\mathbf{x})$

MULTIPLE CHOICE! Remember **slope**

12-y1

x2-**x1**

10. Which choice represents the slope of the secant line **shown?**

7-2

A)

B)

f(7) -f(2)

f(7)-2
7-f(2)

C)

$\frac{f(7)-f(2)}{7-2}$

D)

$\frac{f(7)-f(2)}{7-2}$

Tangent line

11. Which choice represents the slope of **the** secant **line shown?**

A)

$\frac{f(x)-f(x+2)}{x+2-x}$

B)

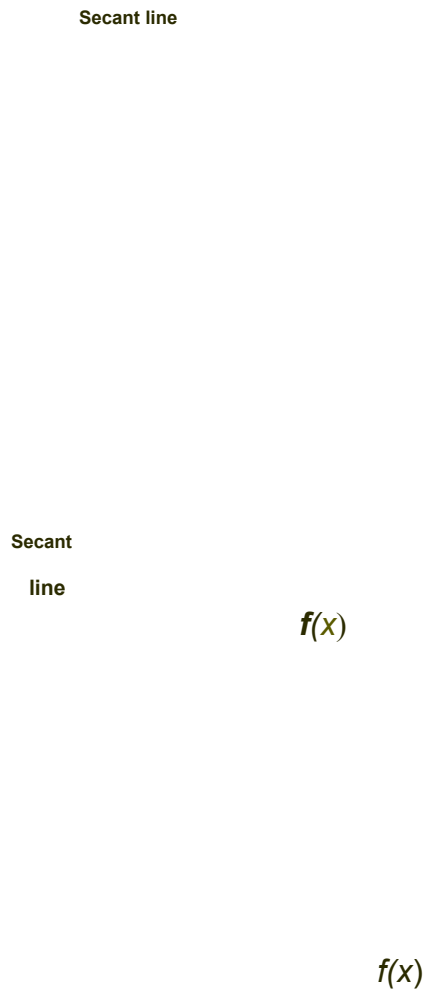
$\frac{f(x+2)-f(x)}{x+2-x}$

C)

$\frac{f(x+2)-f(x)}{x-(x+2)}$

D)

$\frac{f(x)-f(x+2)}{x+2-x}$



12. **Which** choice represents the slope of the secant **line** shown?

A)

$\frac{f(x+h)-f(x)}{x-(x+h)}$

B)

$\frac{x-(x+h)}{f(x+h)-f(x)}$

C)

$\frac{f(x+h)-f(x)}{x+h-x}$

$f(x)-f(x+h)$

Secant line

D) x+h-x

13. Which of the following statements about the function $f(x)$ is true?

I. $f(2) = 0$

II. (x+4) is a factor of $f(x)$

III. $f(5) = f(-1)$

(A) I only

(B) II only

(C) **III** only

(D) I and **III** only

(E) II and **III only**

f(x)

Find the domain and range (express in interval **notation). Find** all horizontal **and** vertical **asymptotes.**

14.

Domain:

15.

Domain:

16.

Domain:

$f(x)/$

Range:

Range:

Horizontal Asymptote(s):

Range:

Horizontal Asymptote(s):

Horizontal Asymptote(s):

Vertical Asymptotes(s):

Vertical Asymptotes**(s)**:

Vertical Asymptotes(s):

MULTIPLE CHOICE!

17. Which of **the** following functions has a vertical asymptote at $x = 4$?

(A) $\frac{x+5}{x^2-4}$

(B) $\frac{x-4}{x^2-16}$

(C) $\frac{4x}{x+1}$

(D) $\frac{x+6}{x^2-7x+12}$

(E) None **of** the above

18. Consider **the** function: $f(x) = \frac{x^2-5x+6}{x^2-4}$

Which of **the** following statements is **true?**

I. $f(x)$ has a vertical asymptote of $x = 2$ II. $f(x)$ has a vertical asymptote of $x = -2$ III. $f(x)$ has a horizontal asymptote of $y = 1$

(A) I only

(B) II only

(C) I and **III only**

(D) II and **III** only

(E) I, II and III

Rewrite the following using rational exponents.

Example: 3

19. √x3 + √√2x

20. √x + 1

1

= x 3

2

WIN

1

21.

x+1

23. +

24.

A√x

1

22.

√x x

− 2√x + 1

Write each expression in radical form **and** positive exponents. **Example:** x 3 + ***x***

2

1

3

25. x 2

x2

28. **(x**+4) **2**

1

26.

x

2+x**−1**

27. 3x **2**

1

/

1

4

2

1

29. $x-2 + x2$

30. $2x-2+3x-1$

Need to know basic trig functions in **RADIANS! We** never use degrees. **You** can either use **the Unit** Circle or Special Triangles **to find the following**.

31. $\sin\frac{\pi}{6}$

32. $\cos\frac{\pi}{2}$

33. $\sin 2\pi$

34. $\tan\pi$

35. $\sec\frac{\pi}{2}$

36. $\cos\frac{\pi}{6}$

37. $\sin\frac{\pi}{3}$

38. $\sin\frac{3\pi}{2}$

39. tan

40. **csc**

41. $\sin\pi$

42. $\cos\pi$

43. Find x where $0 \leq x \leq 2\pi$

44. Find x where $0 \leq x \leq 2\pi$

45. Find x where $0 \leq x \leq 2\pi$

1 sin **x** == 2

tan **x** =

= 0

COS x **=** -1

Solve the following equations. Remember $e^0 = 1$ **and ln 1 = 0**.

46. $e^x + 1 = 2$

47. $3e^x + 5 = 8$

48. $e^{2x} = 1$

49. $\ln x = 0$

50. $3 \ln x = 3$

51. $\ln(3x) = 0$

52. $x2\ 3x = 0$

53. $e^x + xe^x = 0$

54. $e2x - e^x = 0$

Solve the **following** trig equations where $0 \leq x \leq 2\pi$.

55. $\sin x = \frac{1}{2}$

56. $\cos x = -1$

57. $\cos x = \frac{\sqrt{3}}{2}$

58. 2sin x = -1

59. cos x =

响

60. **cos**

61. tan x = 0

62. $\sin(2x) = 1$

63. sin =

For each function, determine its domain and range.

Function

64. **y** = √x-4

65. y = $(x-3)2$

66. y = ln **x**

67. y = ***ex***

68. y = √4- **x2**

Simplify.

√

x **69**.

x

Domain

Range

70. **elnx**

71. e1+**lnx**

72. **In** 1

73. **In** *e7*

75.
log1/28

76. In

2

78. (5a3)
(4a3/2)

4xy−2

79.

1
12x-3y−5

74. log3

2
77. 273
3

80.
(4a33)
3/2

$f(x) = \{(3,5), (2, 4), (1, 7)\}$

$g(x) = \sqrt{x-3}$

If

then determine each of the following.

$h(x) = \{(3,2), (4,3), (1, 6)\}$

81. $(f + h)(1)$

$k(x) =$ x2+5 82. (kg)(5)

83.
$f(h(3))$

84. $g(k(7))$

85. $h(3)$

86. $g(g(9))$

87. $f^{-1}(4)$

88. $k^{-1}(x)$

89.
$k\,(g(x))$

90. $g(f(2))$

I.

Laws of Exponents

Assume a and b are real numbers and m and n are positive integers.

$a^m \cdot a^n = a^{m+n}$

$(ab)^m = a^m \cdot b$

$(a^m)^n = a^{mn}$

$a^{-m} = \frac{1}{a^m}$

ma

Practice: (No Calculators!)

Solve for n:

1. $35n = 35$

$(32m^2$

2

$2.4n+3.162 = 83''$

3n

3. Write in exponential form (with only positive exponents): $\sqrt{8x^6 y^{-4}}$

4. Write in simplest radical form:

$\sqrt{27.9}$

5. Solve: $(3x + 1)^{\frac{3}{4}} = 8$

6.9x

w/ow

+

3

= =

4

m

a^n =

(a)T^m

M

=

Na

m

II. Linear Equations

Practice: Write an equation of a line through the point (a) parallel to the given line and (b) perpendicular to the given line:

1. Point: (1,5) *line*: 6x – 2y = 8

Find the slope and y-intercept of the line:

3. 4x + y = 1

2. 2x–3y = 12

4. y = 2

5. x == 51

Find the equation of a line in slope intercept form: y = mx + b

6. Contains (1, 2) and (-2, 4)

7. Contains (2, 1) and $m = 4$

8. Contains (1,7) and m == 0

9. Contains (6, 5) and m is undefined

III.

Factoring Polynomials

Special Cases:

Perfect Square Trinomials

Difference of Squares

Sum of Cubes

Difference of Cubes

$a2+2ab+b2 = (a+b)2$

$a2 - 2ab+b2 = (a-b)2$

$a2-b2 = (a+b)(a-b)$

$a3 +b3 = (a+b)(a2 - ab+b2)$

$a3 - b3 = (a-b)(a2 +ab+b2$

Practice: Factor completely:

1. $3x^2 - x - 10$

$2.4x^2 + 12x - 7$

3. $x^2 - 10x + 25$

4.4x2 - 4xy + *y2*

2

5.25x2 - 16y2

6

6.64 z

7. *x* 6 - y6

8.3x5 - 48x

9. 8p3 + 1

3

10. *x*(y-2)+3(2 − y)

12. $4x^3 + 8x^2y - 3y^2$

$-11.6x^2 - 7xy - 3y^2$

IV. Polynomial Inequalities

Example: $x^2 - 4x - 5 < 0$

$(x + 1)(x - 5) < 0$

(-1, 5)

Practice:

1. $x^3 + 7x^2 + 10x > 0$

2. $(x^2 - 4x)(x^2 - 4x)(x^2-4x)(x^2-4) \leq 0$

VI. Trigonometry

You **need** to be comfortable **with the** unit **circle, degree** and radian measure. Attached to this packet **is** a blank unit **circle.** You should **be** able to completely fill **in the** unit **circle** within five minutes. You can guarantee you will have a quiz on this frequently! Below is a **completed**

unit circle. **Practice** filling in blank unit **circles until** you can do so within a 5 minute period.

(72)

y

(0,1
)

(1.4)

(号)

3π 3

5
l
m

2

π
3

(12,
12)

(글
(+)-511

5π 135
4 120

90°

60°

ㅠ(욜,
글

ㅍ
ᄒᆞ

6

150°

30

(-1,0)

x

−π-180°

-0° 0

(1,0)

210°

330

77

-117

(-1/3-
2/3)

(6

225

315

5π 240° 270°

300

67 (42,
2)

4 4π

(-12-1
2)

3π
T

5л

3

3

(9.)

2

(글꼴
)

(.*)

(0,
-1)

Key trig identity formulas you should **know**:

Without using a **calculator find each** value:

1. $\cos(-\pi) =$

2. $\sin\frac{3\pi}{11}$

3. $\cos\frac{7\pi}{6}$

4. $\sin(11) =$

5. $\cos$

(i)

$\sin^2\theta + \cos^2\theta = 1$

(ii)

$\tan^2\theta + 1 = \sec^2\theta$

(iv)

$1 + \cot^2\theta = \csc^2\theta$

(v)

$\sin(x + y) = \sin x \cos y + \cos x \sin y$

(vi)

$\sin(x - y) = \sin x \cos y - \cos x \sin y$

(vii)

$\cos(x + y) = \cos x \cos y - \sin x \sin y$

(viii) cos(***x*** - y) = cos ***x*** cos y + sin x **siny**

(ix) sin 20 = 2 sin@cos@

5π

6. **sin**(-2)=

(x

)

cos20 = cos2 - sin2 ***0***

or

= 2 cos2 *0*

-1

= 1-2 **sin2 @**

Positive:

Negative:



Positive:

Negative:

Positive:

Negative:

Positive:

Negative:

-)

DIRECTIONS: Please fill in the (x. y) coordinates above for the Unit Circle. Then proceed by filling in the values of the appropriate sin. cos and tan functions below. You will also receive another copy of this unit circle with your summer letter, so you can practice repeatedly.

sin (0) =

cos(0)
=

siu (π/6)=

cos (5π 6) =

sin(3π/2)
=

COS (
R)

sin (5π: 2)
=

tan (0)

tau (3π 2) =

sin (7/4) =

cos (11π/6)=

sin (π) =

The Unit Circle

Practice filling in this unit circle until you can complete it in 5 minutes.

Place the degree angle measure of each angle in the dashed blanks inside the circle, and the radian measure of each angle in the solid blanks inside the circle. Place the coordinates of each point in the ordered pairs outside the circle.

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Solve **the trigonometric** equations algebraically **by** using identities **and without the** use **of** a calculator. You must **find** all solutions in the interval 0 ≤0≤2**″:**

9. 2sin2 **8-1**=0

10. cosxfonx = cos **x**

11. **sin** x = **sinx**

12. 2 **cos2 x** = COS X

13. 2cos2 **x**+cosx**-1=0**

14. sin2x = COS **X**

We conclude **with** the following definition:

EXPONENTIAL GROWTH MODEL:

Calculator

Consider an initial quantity y, that **changes exponentially** with **time** t. At **any** time t the amount Y after **t units** of time **may be** given **by**:

$Y =$

Ye^{11}

Where k>0 represents the growth rate and k<0 represents the decay rate.

27. Growth of Cholera**: Suppose that the** cholera **bacteria** in a **colony** grows **according to the exponential model** P= Pe**"). The colony starts** with **1** bacterium **and doubles** in **number every** half hour. How many **bacteria** will the **colony contain** at **the end of** 24 hours?

28. **Bacteria** Growth: A colony **of bacteria is** grown under **ideal** conditions in a **laboratory** so **that the** population increases **exponentially with time**. **At** the **end of 3** hours **there** are 10,000 **bacteria**. **At the end** of 5 h **there** are 40,000 bacteria. **How many bacteria** were present initially**?**

The half-**life** of **a radioactive** element **is the** time required **for** half **of** the radioactive nuclei present in a **sample** to decay. **The next problem shows that** the **half**-life is a constant **that depends only on the** radioactive substance and **not on** the number **of radioactive nuclei** present in **the sample**.

29) Find the half-life of a **radioactive substance** with **decay equation** $y=y_0e^{-bt}$ and show **that**

the half-life depends only on k. **(hint**: set **up the** equation $y=\frac{1}{2}y_0$ **Solve** it

algebraically for t!)

30) Using **Carbon**-14
Dating

Scientists **who do** carbon-**14** dating use 5700 **years for** its **half-life**. Find the **sample in which** 10% of the radioactive nuclei **originally** present have **decayed**.

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