**Colorado Technical University**

**Course:** MATH207 – Integral Calculus

#### Unit 1 Part 1 Readings: Calculus of Trigonometric Functions

**How to Do Integration Problems**

Trick 0: come up with an equation involving dy/dx (y and x will be the variables you are

## interested in)

## Trick 1: split the dy and dx into two sides of the equation

## Trick 2: integrate both sides

## Trick 3: combine the “c”s

Trick 4: use any known values (like at t=0) to find a value for c

## Useful EE Formulas (thank you, Stephen Yim!)

|  |  |
| --- | --- |
| v(t) = dw/dq  v(t) is the voltage (volts)  w is the energy (joules)  q is the charge (coulombs)  i(t) = dq/dt  i(t) is the current (amps) t is the time (sec)ic = C dv/dtic is instantaneous capacitorcurrent in ampsC is capacitance in farads (F) | p(t) = dw/dt  = (dw/dq)(dq/dt)  = v(t)×i(t)  p(t) is the power in joules/sec or watts  vcoil = N dw/dt  vcoil is the instantaneous coil voltage  (in volts)  N is the number of primary turns  VL = L di/dt  VL is the instantaneous inductor voltage  L is the inductance in henrys (H) |

**Circuit Analysis**

**Impedance** Z (in ohms Ω) comes from the Pythagorean Theorem:

**R**

*θ*

**Z**

Z =

The p**hase angle** (in degrees):

*θ* = tan-1

Resistance (R) and reactance (X) are 90° apart, so their angle of

intersection forms a right angle

Adding the impedance (Z) line at the angle *θ* makes a right triangle

This is called the “**impedance triangle**”

**Trig Calculus**

**Derivatives of Transcendental Functions**

sin *u* = cos *u* cos *u* = –sin *u* tan *u* = sec2 *u*

sec *u* = sec *u* tan *u*  csc *u* = csc *u* cot *u*

sin-1 *u* = cos-1 *u* = tan-1 *u* =

cot -1 *u* = sec-1 *u* = csc-1 *u* =

logb *u* = 1/(u ln(b)) b*u* = b*u* ln(b) ln *u* = e*u* = e*u*



