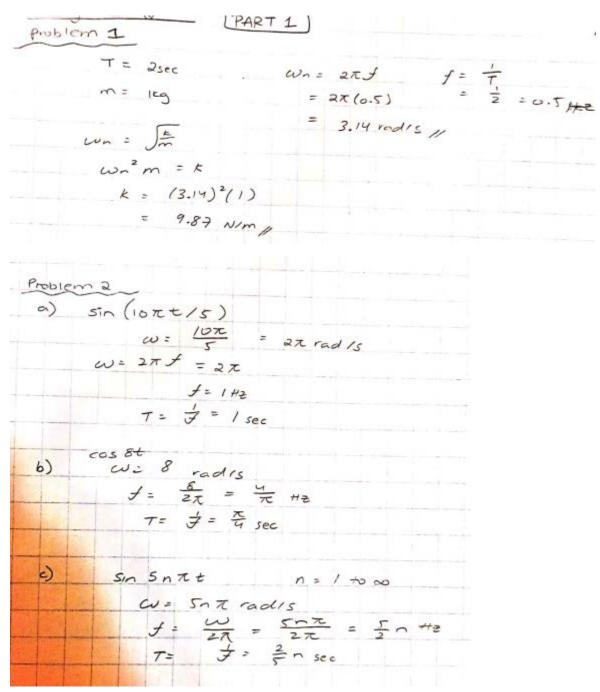
## Measurement Tutorial 2

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### PART 1:



# Problem 3 a) $Y(t) = 2\sin 4\pi t + 4\cos 4\pi t$ $= 2\sin 2(2\pi t) + 4\cos 2\pi t + 4(\cos^2(2\pi t) - \sin^2(2\pi t))$ $= 2(2)\sin 2\pi t \cdot \cos 2\pi t + 4(\cos^2(2\pi t) - \sin^2(2\pi t))$ $= 4\sin 2\pi t \cdot \cos 2\pi t + 4\cos^2(2\pi t) - 4\sin^2(2\pi t)$ $= 4\sin 2\pi t \cdot 1 - 2\sin^2(2\pi t) + 4(1-\sin^2(2\pi t)) - 4\sin^2(2\pi t)$ $= 4\sin 2\pi t \cdot 8\sin^2(2\pi t) + 4(1-\sin^2(2\pi t)) - 4\sin^2(2\pi t)$ $= 4\sin 2\pi t - 8\sin^2(2\pi t) + 4(1-\sin^2(2\pi t)) + 4\sin^2(2\pi t)$ $= 4\sin 2\pi t - 16\sin^2(2\pi t) + 4(1-\sin^2(2\pi t)) + 4\sin^2(2\pi t)$

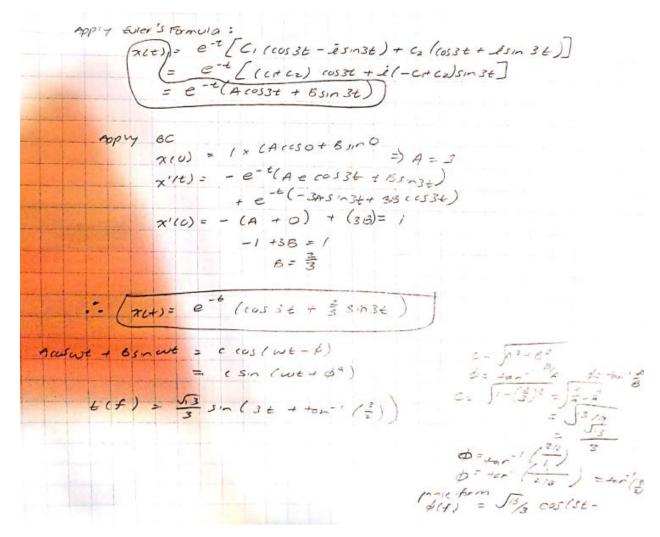
b) Y(+) = 52 cos (8+ -45°) Already in cosine

# problem 3 ront'd

c)  $Y(t) = 2 \cos 3t + 5 \sin 3t$   $= 2 \left[ 4 \cos^3 A - 3 \cos A \right] + 5 \left[ 2 \sin A - 4 \sin^3 A \right]$   $= 8 \cos^3 A - 6 \cos A + 15 \sin A - 20 \sin^3 A$   $= 2 \cos A \left[ 4 - 4 \sin^2 A - 3 \right] + \left( 5 \sin A \left[ 3 - 4 \sin^2 A \right] \right)$  $= 2 \int_{1-\sin^2 A} \left( 1 - 4 \sin^2 A \right) + 5 \left( \sin A \right) \left( 3 - 4 \sin^2 A \right)$ 

Problem 4

$$m = \frac{1}{2} \times \frac{1}{2} \times$$



PART 2:

```
%problem 5
   %%parta)
   syms x y;
   y = x^3 - 3*x^2 + x;
   %%partb)
   syms a b;
   b = sin(a) + tan(a);
   %%partc)
   syms c d;
   d=(2*c^2 - 3*c - 2)/(c^2 - 5*c);
   %%partd)
                                    >> Problem5
   syms e f;
                                    x^3 - 3*x^2 + x
   f=(e^2-9)/(e+3);
                                    sin(a) + tan(a)
   disp(y)
                                    (-2*c^2 + 3*c + 2)/(-c^2 + 5*c)
   disp(b)
   disp(d)
                                    (e^2 - 9)/(e + 3)
   disp(f)
  %Problem 6
   %%First eqn part a and b
                                       >> Problem6
   syms y x;
   y = x^3 - 3*x^2 + x;
                                       ans =
   expand(y)
  factor(y)
                                       x^3 - 3*x^2 + x
  %%Second eqn part a and b
   syms a b;
                                       ans =
  b=((2*a^2) - (3*a)-2)/(a^2 - 5*a);
   expand(b)
                                       [x, x^2 - 3*x + 1]
   factor(b)
ans =
(3*a)/(-a^2+5*a) + 2/(-a^2+5*a) - (2*a^2)/(-a^2+5*a)
ans =
[2*a + 1, a - 2, 1/a, 1/(a - 5)]
```

```
>> Problem7
                                              x =
                                              7/2
                                              у =
                                              1
                                              z =
                                              5/2
%Problem 7
                                             E1 =
syms x y z;
                                              3
one=2*x + y - 2*z == 3;
two=x-y-z==0;
                                              E2 =
three=x+y+3*z ==12;
%parta
                                              0
[x,y,z]=solve(one,two,three)
%partb
                                              E3 =
E1=subs(2*x + y - 2*z, [x, y, z], [7/2, 1, 5/2])
E2=subs(x-y-z,[x,y,z],[7/2,1,5/2])
                                              12
E3=subs(x+y+3*z,[x,y,z],[7/2,1,5/2])
%partc
                                              doubleN =
symN=sym([7/2,1,5/2]);
doubleN=double(symN)
                                                  3.5000 1.0000 2.5000
```

## Problem 8:

>> Problem8

A =

2 1 -2 1 -1 -1 1 1 3

B =

3 0

12

X =

# PART 3:

