CPE381 #3

GEOMETRIC SERIES

$$a + a\cdot r + ar^2 + \dots + ar^{n-1} = \sum_{k=0}^{n-1} ar^k = a\cdot\frac{1-r^n}{1-r}$$

$$\sum_{n=0}^{\infty} 0.5^n = \frac{1-0.5^{\infty}}{1-0.5} = \frac{1-\left(\frac{1}{2}\right)^{\infty}}{1-\frac{1}{2}} = \frac{1-\frac{1}{2^{\infty}}}{1-\frac{1}{2}} = 2$$

$$\left(\frac{1}{2}\right)^{\infty} = \frac{1^{\infty}}{2^{\infty}} = \frac{1}{\infty} \to 0$$

ARITHMETIC SERIES

$$a_n = a_1 + (n-1)\cdot d$$

$$\sum_{i=1}^{n} a_i = n\cdot\frac{a_1 + a_n}{2}$$

$\Rightarrow 2, 5, 8, 11, 14$

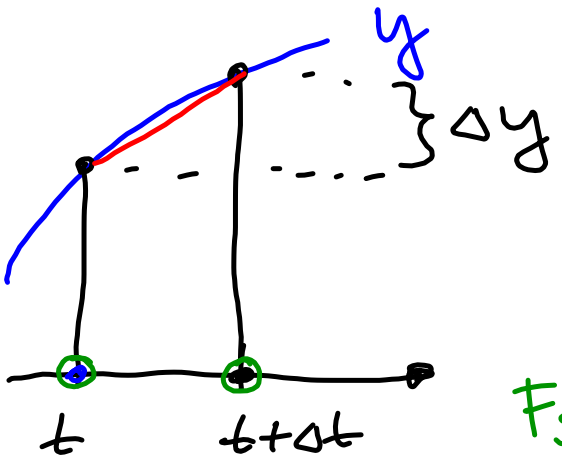
$d = 3$

$a_1 = 2$

$n = 5$

$$5\cdot\frac{2+14}{2} = 5\cdot 8 = 40$$

DIFFERENTIAL



$$y' = \lim_{\Delta t \to 0} \left(\frac{\Delta y}{\Delta t} \right)$$

$$y' \approx \frac{y(t+T_s) - y(t)}{T_s}$$

$F_s = 20Hz$

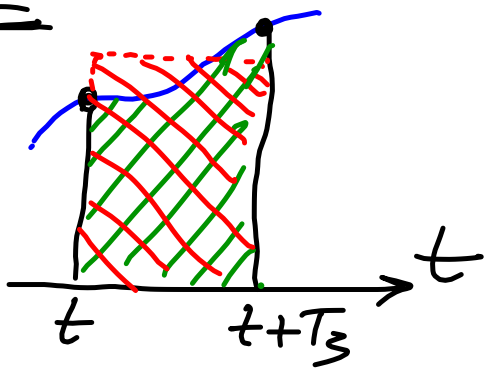
$T_s = \frac{1}{F_s} = \frac{1}{20Hz} = 50ms$

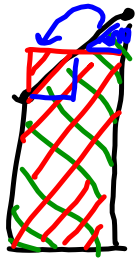
$\frac{1}{Hz} = \frac{1}{\frac{1}{s}}$

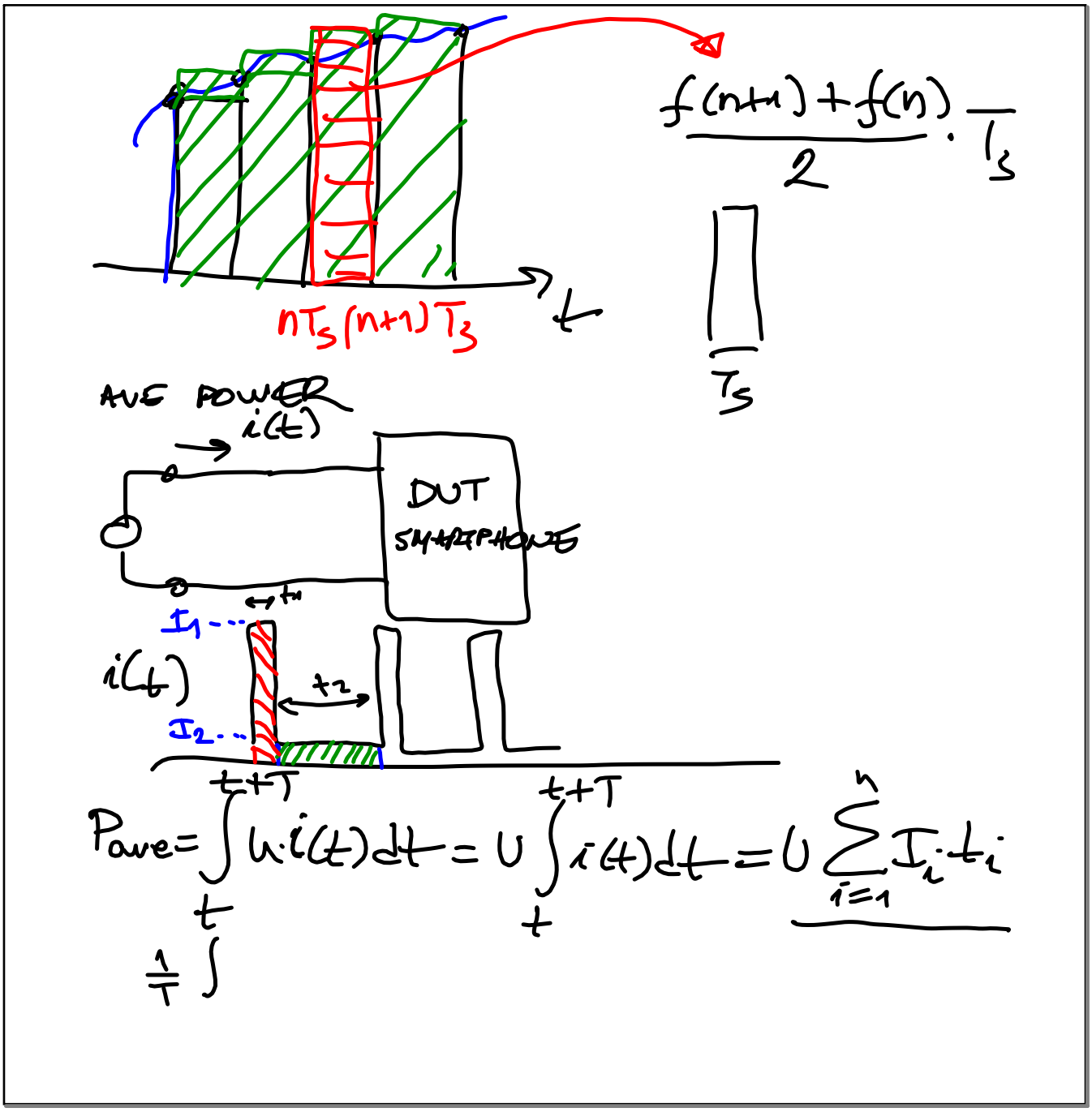
$[s]$

INTEGRAL

$$\frac{\int_{t_1}^{t_2} y(t)\,dt}{t_2 - t_1} =$$



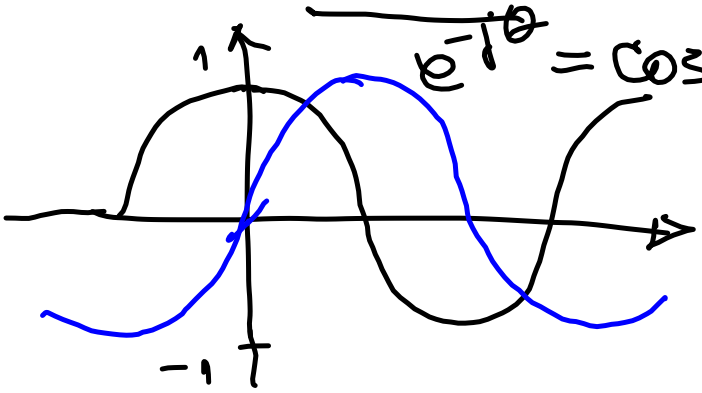



nTs (n+1)Ts
t
f(n+1)+f(n) / 2 · Ts
Ts
AVE POWER
i(t)
DUT
SMARTPHONE
t1
I1
i(t)
t2
I2
t+T
t+T
Pave = ∫ u·i(t)dt = U ∫ i(t)dt = U Σ Ii·ti
t
t
1/T ∫

$$e^{j\theta} = \cos\theta + j\sin\theta$$

$$e^{-j\theta} = e^{j(-\theta)} = \cos(-\theta) + j\sin(-\theta)$$

$$e^{-j\theta} = \cos\theta - j\sin(\theta)$$



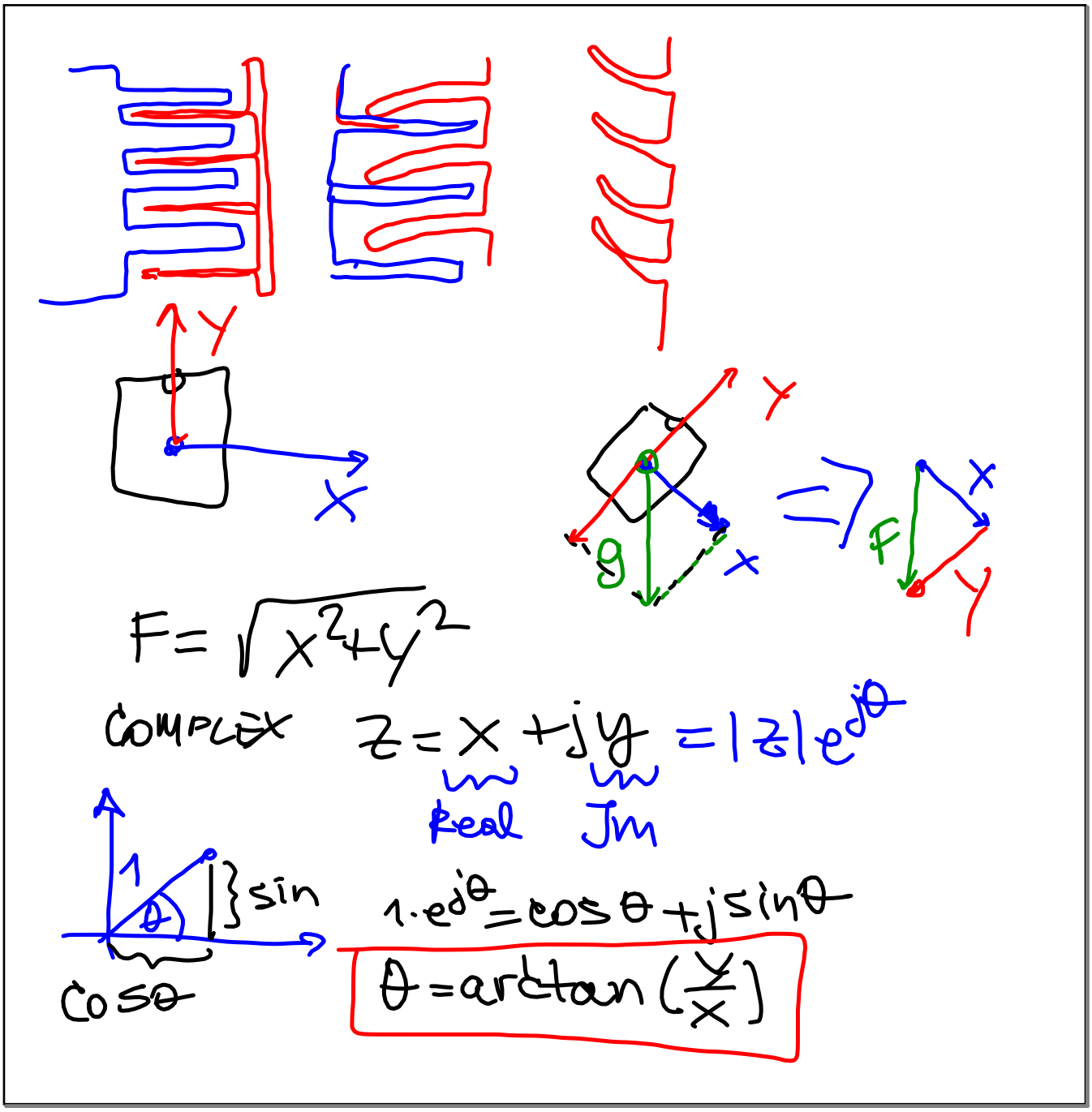
1 $e^{j\theta} = \cos\theta + j\sin\theta$

2 $e^{-j\theta} = \cos\theta - j\sin\theta$

\+ $e^{j\theta} + e^{-j\theta} = 2\cdot\cos\theta \Rightarrow \cos\theta = \frac{e^{j\theta} + e^{-j\theta}}{2}$

\- $e^{j\theta} - e^{-j\theta} = 2j\sin\theta$

$$\sin\theta = \frac{e^{j\theta} - e^{-j\theta}}{2j}$$


Y
X
Y
X
g
X
F
X
Y
$F = \sqrt{X^2+Y^2}$
COMPLEX $Z = X + jy = |z| e^{j\theta}$
Real
Jm
1
θ
sin
cosθ
$1 \cdot e^{j\theta} = \cos\theta + j\sin\theta$
$\theta = \arctan\left(\frac{Y}{X}\right)$