

CAD Practical Midterm Exam 20%

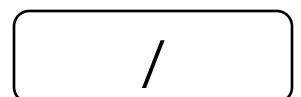
Spring 2022

Time: 40 minutes

..... الاسم: رقم القيد: المجموعة:

Q: (8 Marks) Solve the following Mathematical expressions using MATLAB:

Mathematical Expression	MATLAB Code
$\frac{d}{dt} \ln(2t)\sin(2t)$	<pre>syms t diff(log(2*t) * sin(2*t)) ans = sin(2*t)/t + 2*cos(2*t)*log(2*t)</pre>
$\int_0^{\pi} 4t^3 \cos(t^4) dt$	<pre>syms t int(4*t^3*cos(t^4), 0, pi) ans = sin(pi^4)</pre>
$\int e^{-t} t^3 dt$	<pre>syms t int(exp(-t)*t^3) ans = -exp(-t)*(t^3 + 3*t^2 + 6*t + 6)</pre>
$k = \sum_{n=1}^{100} \frac{2n+1}{n!}$	<pre>n = 1:100; k = sum((2*n + 1)./factorial(n)) k = 7.1548</pre>



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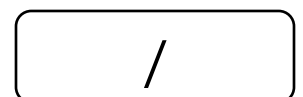
Q: (6 Marks) Solve the following Algebraic Equations using MATLAB, ***your answer must be in decimal form:***

$$\begin{array}{ll} 2x - 2z + 36 = 3 + 4y - 7z & 2x - 4y + 5z = -33 \\ 2x - y + z + 2 = z - 2x - 3 & 4x - y + 0z = -5 \\ x + 2y - 6z - 7 = 3x + 12 - 3z & -2x + 2y - 3z = 19 \end{array}$$

```
>> A = [2 -4 5; 4 -1 0; -2 2 -3]; b = [-33 ; -5 ; 19];
>> linsolve(A,b)
ans =
-0.5000
3.0000
-4.0000
```

$$\frac{1}{x-3} + \frac{1}{x+3} = \frac{-10}{x^2-9} \quad \rightarrow \quad \frac{1}{x-3} + \frac{1}{x+3} + \frac{10}{x^2-9} = 0$$

```
syms x; double(solve( 1/(x-3) + 1/(x+3) + 10/(x^2-9) ))
ans =
-5
```



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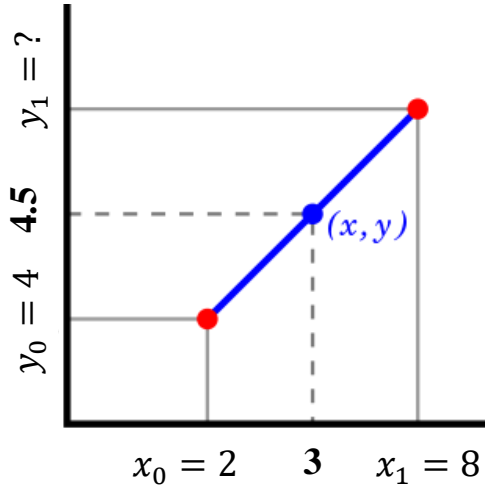
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Q: (3 Marks) Create a MATLAB function and use it to get the **unknown** in the graph:

$$\frac{y - y_0}{x - x_0} = \frac{y_1 - y_0}{x_1 - x_0},$$



```
>> syms x0 y0 x y x1 y1
```

```
>> y1 = @(x0,y0,x,y,x1) (x1-x0)*(y-y0)/(x-x0) + y0
```

```
y1 =
```

```
function_handle with value:
```

```
@(x0,y0,x,y,x1) (x1-x0)*(y-y0)/(x-x0)+y0
```

```
>> y1(2,4,3,4.5,8)
```

```
ans =
```

```
7
```

Best of luck