

Score:

Name: _____

Section (circle one): 1 2 3 4 5 6

Team (circle one): a b c d e f

SM233 – Test #1

1. `x=4;`
`if x>3`
`y=1;`
`else`
`y=2;`
`end`

2. `x=4;`
`if and(x>0, x<=2)`
`y=1;`
`elseif or(x<4, x>0)`
`y=2;`
`else`
`y=3;`
`end`

y=	y=
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3. `x=(1:4)'`
`M=ones(1,4)*x;`

4. `x=(1:4)`
`M=ones(4,1)*x`

M=	M=
----	----

5. `x=0;`
`for n=1:4;`
`if x<4;`
`x=x+2;`
`else`
`x=x-1;`
`end`
`end`

6. `x=[1:10];`
`y=0;`
`while y<10,`
`y=y+x^2;`
`end`

x=	y=
----	----

7. `A=[1,2;3,4]`
`B=[0,3;2,-3]`
`M= A*B`

8. `y=0;`
`for n=2:4`
`y=y+n^2;`
`end`

M=	y=
----	----

9. `A=[1,2;3,4]`
`B=[0,3;2,-3]`
`M= A.*B`

10. `M=[1,2,3;4,5,6;7,8,9]`
`Ms=M(2:2,2:3).^2;`

M=

Ms=

11. `M=eye(3) +ones(3)`

12. `x=[1:.01:2]`
`y=x.^4;`
`plot(x,y);`
`a=axis`

M=

a=

13. `x=[1,2,3]`

14. `f=inline('x.^2+2.*x+3');`
`x=[1,2];`
`y=f(x);`

`x*x'`=

y=

15. `x=[1;2;3]`

16. `f=inline('x.^2+y.^2');`
`x=[1,2]; y=[3,4];`
`z=f(x,y)`

`x*x'`=

z=

17. `x=floor(rand(1,4));`
`y=ceil(rand(1,4));`
`z=y>x;`

18. `x=[1:10];`
`y=x<=4;`

z=

y=

19. `n=2+5>11-6<3^2`
`if n=1,`
`coin='heads';`
`else`
`coin='tails';`
`end`

20. `x=[1:10];`
`y=find(floor(x./2)~=x./2)`

coin=

y=

SM233 – Test #1-Programming Problem

1. How many ways can you toss m heads if a coin is tossed n times. The answer is given by the equation:

$${}^nC_m = \binom{n}{m} = \frac{n!}{m! (n-m)!},$$

where $n! = 1 \times 2 \times 3 \times \dots \times n-1 \times n$. Here nC_m means "n chose m". Write a program that will take n and m as inputs and calculate a variable nC_m is an output. (Do not use MATLAB's factorial function). Does it make sense for m to be greater than n ? If not, write code to prevent this case from executing. (To accomplish this, use the 'return' command). Use the program to determine how many ways you can toss exactly 7 tails in 15 coin tosses.

2. You have won the lottery. You have a choice of one of two prizes:

- a. You may receive \$10,000,000 on the spot, or ...
- b. You can take your winnings in accordance with the following payout schedule:
 - Day 1 you receive 1 cent.
 - Day 2 you receive treble the winnings collected on day 1, i.e. 3 cents (cumulative winnings is 4 cents).
 - Day 3 you receive triple the winnings collected on day 2, i.e. 9 cents (cumulative winnings is 13 cents).
 - Continue this payout scheme for 20 days.

Show that the latter scheme is more lucrative. On what day do winnings exceed \$5,000,000?

3. (Extra Credit 5 pts) A rural pasture Montana can sustain 11 sheep for 8 days. If the number of sheep is reduced to 10, there will be enough food for 9 days. Theoretically, how long can 2 sheep survive on this field. State your reasoning and your answer. No program is required, but you may use MATLAB if you wish.