	Date	21/06/2022
	Class	S6EN
	Subject	MATHEMATICS 3-Period Part A
	Duration	45 Minutes
	Teacher	D. Shaw

école européenne de strasbourg

NAME :		
Marks	*Comments*	*Signature*
/35		

Test WITHOUT calculator

Instructions

- *This exam consists of 5 questions on 5 pages including this cover page.*

- *All questions are compulsory.*

- *Answer directly on the question paper*

- *Any attempt at cheating will result in the immediate cancellation of your exam.*

- *Read all the questions calmly and thoroughly and show all workings clearly.*

Good luck!

Question 1: [9 Marks]

We throw a coin three times in a row to see how many heads or tails we get.
 	
Consider the following events:
 	
A : « We get at least two heads ».
B : « We get tails less than three times».
C : « We get exactly three heads or exactly three tails ».
 	
Verify if the events are independent of each other :
    a) Are A and B independent events ?
    b) Are A and C independent events ?
    c) Are B and C independent events ?
	
	/3
	/3
	/3

Question 2: [4 Marks]

Six sprinters compete against each other in a final. How many different arrangements could we have on the podium? (The podium consists of a gold medal winner, a silver medal winner and a bronze medal winner).	/4

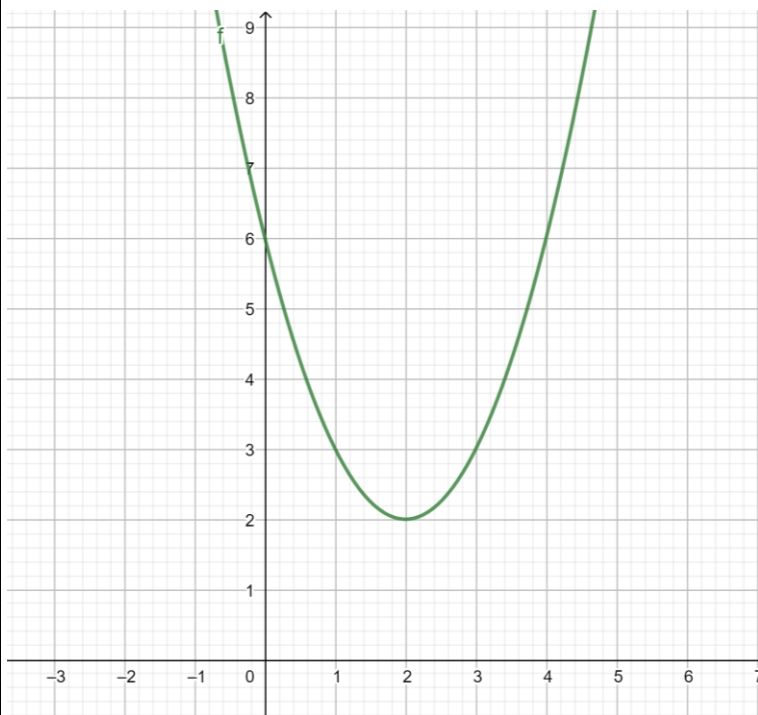## Question 3: [7 Marks]

a) Find the equation of the tangent line to the function f at the point (1,3), given: $f(x) = x^2 - 4x + 6$

/5

b) <u>Accurately</u> draw the tangent to the function on the accompanying graph.

/2

Question 4: [8 Marks]

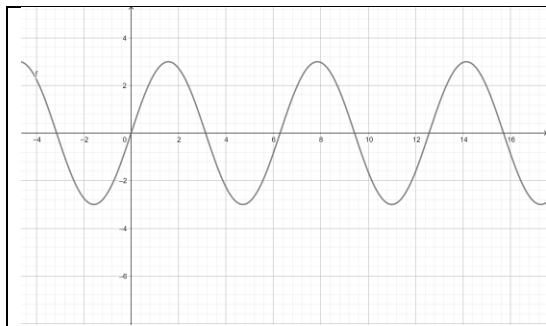Match each of the following functions to their corresponding graph:

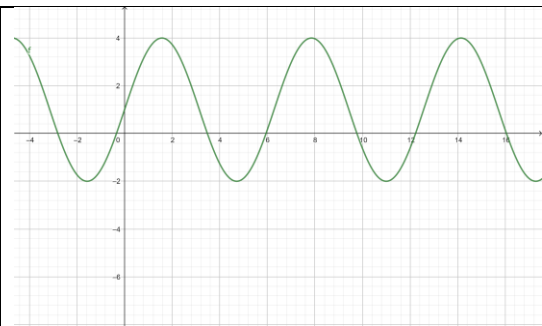| Function	Graph	
$3Cos\ (x) - 3$		/2
$3Sin(x)$		/2
$Sin\ (2x + 2)$		/2
$3Sin\ (x) + 1$		/2

A

B
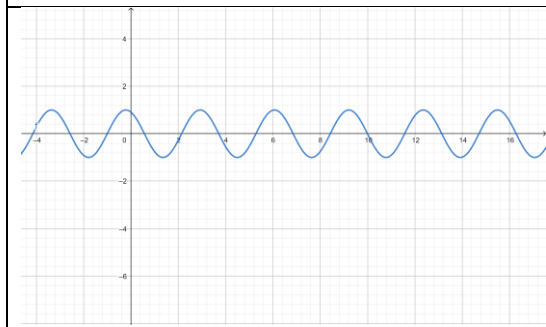
C
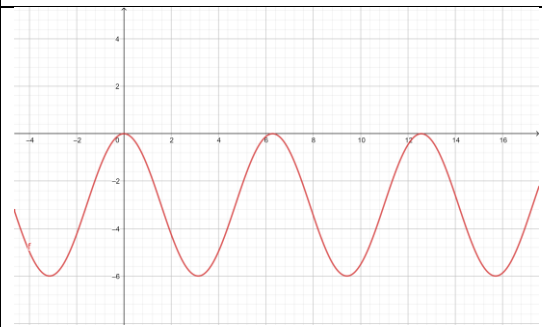
D

Question 5: [7 Marks]

The following data set can be modelled by the function:

$$f(x) = a\, Cos\big(b(x - c)\big) + d$$

x	2	3	4	5	6	7	8	9	10	11
y	11	9.8	7	4.2	3	4.2	7	9.8	11	9.8

a) Estimate the amplitude of the function.   /1

b) Estimate the period of the function.   /1

c) Estimate the vertical translation of the function.   /1

d) Estimate the horizontal translation of the function.   /1

e) Fill in the appropriate values of a, b, c and d to write the cosine   /3
   function which models the data