6492MD: Assignment 4

Before completing this assessment you need to work through

either	or
Maths in Focus 11 Mathematics Advanced 3RD EDITION Published: 21/12/2018 ISBN: 9780170413152 Author: Margaret Grove Chapter 7 Probability Chapter 8 Exponential and Logarithmic functions	Maths in Focus 11 Mathematics Extension 1 3RD EDITION Published :08/11/2018 ISBN :9780170413299 Author : Margaret Grove Chapter 9 Probability Chapter 10 Exponential and Logarithmic functions

What you need to do

- Attempt all questions.
- **Write your answers using a black pen on your own paper.**
- Show all necessary working. Marks are given for correct working.
- Leave plenty of space around your answers for your teacher's comments.
- If you have studied the work in your textbook, and you are stuck on an assignment question, you can contact us for help.
- It is important to present your work clearly and well to avoid having it returned to you unmarked as a non-serious attempt.

Write your answers using a black pen on <u>your own paper</u>.
Five multiple choice questions: Choose the **correct** answer A B C or D.
No working is required for multiple choice questions.

A	B	C	D

1. Two dice are rolled. What is the probability of getting at least one 5 or 6?

$\frac{20}{36}$	$\frac{16}{36}$	$\frac{12}{36}$	$\frac{4}{36}$

2. Evaluate $e^{2.7}$, correct to 2 decimal places.

0.99	1.00	14.87	14.88

3. The derivative of $y = 5e^{3x-1}$ is

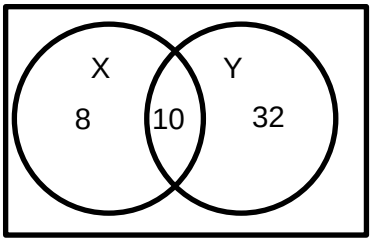
$15e^{3x-1}$	$15e^{3}$	$5e^{3x-1}$	$5e^{3}$

4. If $P(A) = \frac{2}{9}$, $P(B) = \frac{4}{9}$, and $P(A \cap B) = \frac{1}{9}$

Then $P(A \cup B) =$

$\frac{3}{9}$	$\frac{4}{9}$	$\frac{5}{9}$	$\frac{6}{9}$

5. For the Venn diagram



$P(X|Y) =$

$\frac{10}{32}$	$\frac{8}{32}$	$\frac{10}{42}$	$\frac{8}{42}$

For the following questions, **write your answers using a black pen on <u>your own paper</u>. Show all necessary working.** Marks are given for correct working.

6. A bucket contains four black and three white balls. Two balls are randomly selected without replacement. What is the probability that the balls are :

   (a) both white?

   (b) white and black?

   (c) both the same colour?

   (d) If the first ball is black, what is the probability of the second ball being black?

7. In a certain strain of plant the probability that a seed will produce a pink flower is $\frac{1}{5}$.

   (a) What is the probability that the seed produces some other colour?

   (b) If two seeds are randomly selected, what is the probability that at least one seed will produce pink flowers?

   (c) Determine the least number of seeds that must be planted so that the probability of obtaining at least one pink flower exceeds 0.99.

8. A box contains 30 light globes. 4 are defective. Two are picked at random. What is the probability that

   (a) the first globe picked is defective?

   (b) both are defective?

   (c) neither one is defective?

   (d) at least one is defective?

9. Solve for x:

   (a) $2^{x-3} = 14.9$ (answer to one decimal place)

   (b) $\log_x 7 = \frac{\log_2 7}{\log_2 5}$.

   (c) $9^{2x+4} = 1594323$

   (d) $\ln(x+2) = -3$ (answer to two decimal places)

10. Find the gradient of the curve $y = \frac{e^{-3x}}{x^3+4}$ at the point where $x = 0.23$.

11. Given that $\log_a P = 3.8$ and $\log_a Q = 7$, evaluate:

    (a) $\log_a(PQ)$

    (b) $\log_a\left(\frac{P}{Q}\right)$

    (c) $\log_a(Q^3)$

12. The real value v (dollars) of a certain piece of industrial equipment has been found to behave according to the function $v = 100000e^{-0.3t}$, where t measures the years since original purchase.

    (a) What is the original value of the equipment?

    (b) What is the expected value after five years?

    (c) How long does it take for the resale value of the equipment to reach fifty per cent of its original value?

    (d) Find the rate of depreciation $\frac{dv}{dt}$ after five years.

Checklist

I have:

- answered every question
- written my answers using a black pen on my own paper
- shown necessary working

If you are unable to complete this task for a specific reason, please contact your teacher to discuss alternative arrangements for demonstrating your skills and knowledge.