NAME:	CLASS:
1 11 11 11 11 11 11 11 11 11 11 11 11 1	

MATHEMATICS P425/2 TEST FOR 15 JUNE 2018

TIME: 1 HOUR

Answer **all** the questions.

- 1. A multiple choice exercise has ten questions each with 5 possible answers. If one student guesses all the questions, what is the probability that he gets at least 2 answers correct?
- 2. At 0900 hours two ships A and B are 10 km apart with B due east of A. A is travelling at 20 kmh^{-1} in a direction $N 60^{\circ} E$ and B is travelling at 10 kmh^{-1} due north.

Show that if the two ships maintain these velocities, they will collide at approximately 0935 hours.

- 3. Use the trapezium rule with six ordinates to estimate $\int_{2}^{5} \log_{5} x \, dx$ correct to three decimal places.
- 4. Particles of masses 4 kg, 5 kg, 3 kg and 4 kg are attached at the corners A, B, C and D af a rectangle ABCD in which AB = 12 cm and BC = 20 cm. Find the coordinates of the centre of the gravity of the particles.
- 5. A sample of size 49 is randomly drawn from a normal population with mean 54 and variance 64. Find the probability that the mean will lie between 52 and 55.
- 6. The table below is an extract from tables of tangents.

θ	24'	30'	36'	42'
tan 25°	0.4748	0.4770	0.4791	0.4813

Use linear interpolation or extrapolation to find,

- (i) $\tan 25^{\circ}18'$ (ii) $\tan^{-1}0.4775$.
- 7. A conical pendulum consists of a light inextensible string AB of length 60 cm fixed at A and carrying a bob of mass 1.2 kg at B. The bob describes a horizontal circle about the vertical through A with a constant angular speed of $5 rad s^{-1}$. Calculate the tension in the string.

Ecolebooks.com



8. A continuous random variable X has a probability distribution function given by

$$f(x) = \begin{cases} \frac{1}{4}x(4-x^2): 0 \le x \le 2\\ 0 & otherwise \end{cases}$$
. Find the variance of X.