

# MATHEMATICS ENTRANCE EXAM PAPER

**A level**

**Time permitted: 45 minutes**

Calculators are **not** allowed

**Answer all questions, showing your method and workings. Underline your final answer.**

Before you start the paper, please fill in the details below

Today's Date: \_\_\_\_\_

Your surname: \_\_\_\_\_

Your first name: \_\_\_\_\_

Your Date of Birth: Day: \_\_\_\_\_ Month (in words): \_\_\_\_\_ Year: \_\_\_\_\_

Please return to [international@rendcombcollege.org.uk](mailto:international@rendcombcollege.org.uk)

1. If  $x = -5$  and  $y = 2$ , evaluate the following

(a)  $(2x)^2 - 3y^2$

.....

(b)  $xy^2$

.....

(c)  $-7 - 2x$

.....

2. Simplify the following

(a)  $8t^5 \div 2t^2$

.....

(b)  $(5m^2)^3$

.....

(c)  $\frac{rs}{3t} \times \frac{9s^2t}{3r}$

.....

(d)  $\frac{s^3}{t^3} \div \frac{s}{t}$

.....

(e)  $\frac{3y+4}{6} + \frac{2y-1}{9}$

.....

(f)  $\frac{4}{3p} - \frac{5}{6p}$

.....

3. If  $2x + 3y = 5$ , re-arrange the equation making  $x$  the subject.

$$x = \dots\dots\dots$$

4. Make  $x$  the subject of this formula

$$a(x - 2) = b(x + 1)$$

$$x = \dots\dots\dots$$

5. Make  $l$  the subject of this formula

$$T = 2\pi \sqrt{\frac{l}{g}}$$

$$l = \dots\dots\dots$$

6. Calculate

(a)  $2\frac{2}{3} - 1\frac{1}{5}$

.....

(b)  $1\frac{1}{4} \times 2\frac{1}{3}$

.....

(c)  $\frac{\frac{1}{4} \times \frac{2}{3} \times \frac{1}{2}}{6}$

.....

7. Write the following in the form  $2^n$  ( for example  $8 = 2^3$  )

(a) 64

.....

(b) 1

.....

(c)  $\frac{1}{4}$

.....

(d)  $8^6$

.....

8. Expand the brackets and simplify

(a)  $3p(p + 4) - p(p - 2)$

.....

(b)  $(2e - 3)(3e + 1)$

.....

(c)  $(x + \frac{1}{x})^2$

.....

9. Solve the following equations

(a)  $3(x + 2) - 2(2x - 3) - 7 = 0$

X = .....

(b)  $\frac{t+3}{2} = \frac{t-3}{5}$

t = .....

(c)  $x^2 + 4x - 21 = 0$

x = .....

(d)  $2x + 3y = 5$   
 $5x - 2y = -16$

x = ..... y = .....

10. Fully factorising  $10x^2 + 25x$  gives  $5x(2x + 5)$

Now fully factorise the following

(a)  $15p^2q - 3pq^2$

.....

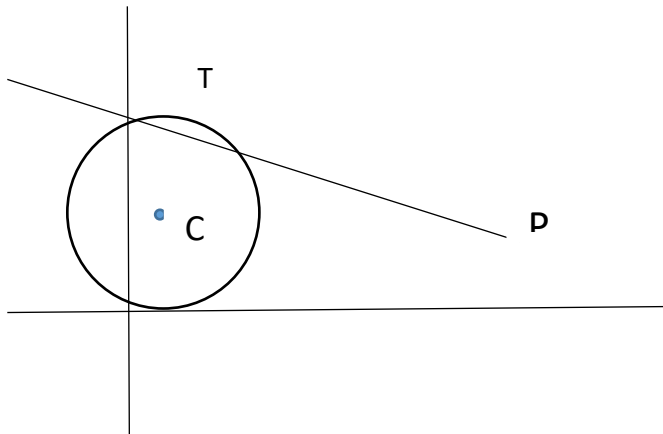
(b)  $x^2 - 16$

.....

(c)  $4x^2 + 9x + 2$

.....

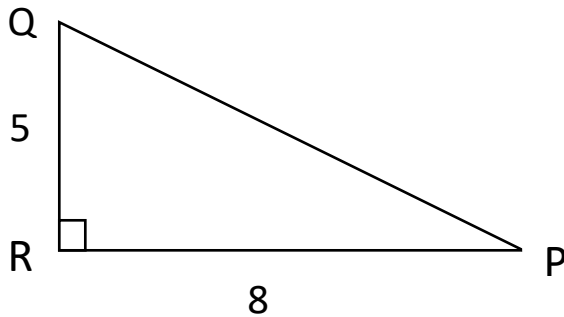
11.



A tangent from point P at (7, 4) meets the circle at point T.  
The circle has a centre at (1, 4) and a radius of 3 units.  
What is the length of the line TP?

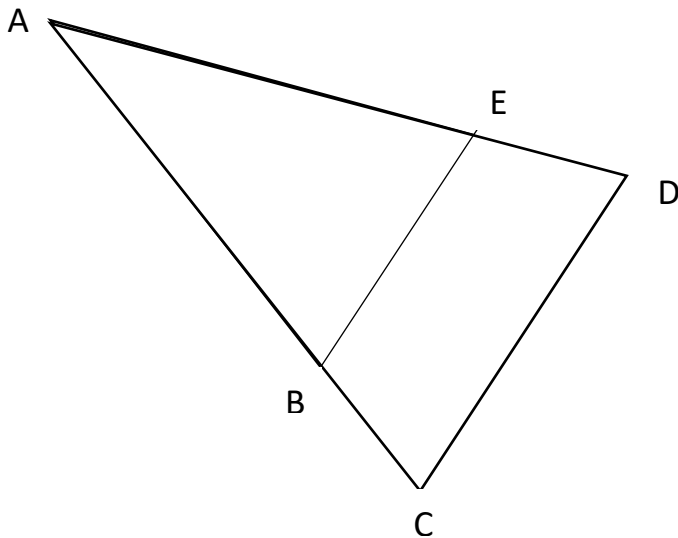
TP = .....

12. From this triangle write down the exact values of  $\sin P$  and  $\tan P$ .



$\sin P = \dots\dots\dots$      $\tan P = \dots\dots\dots$

13. BE and CD are parallel.  
AB = 5cm, BC = 4cm and CD = 12cm  
Find the length of BE



BE = .....