SCAN ME

crashMATHS

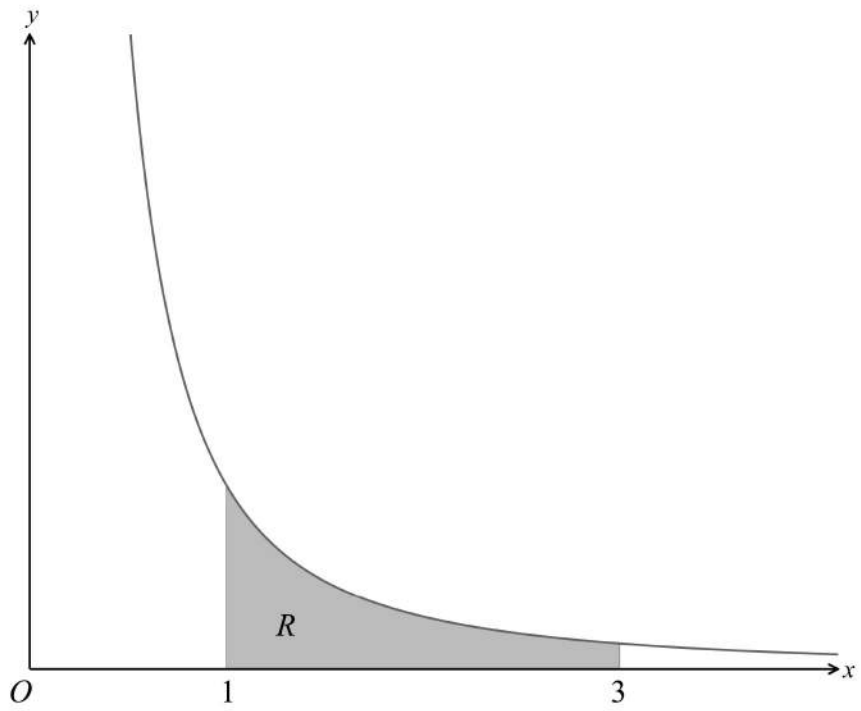
C2 PAPERS

PRACTICE PAPER C

crashmathsworksheets

75 MARKS / 1 HOUR AND 45 MINUTES

1 The diagram below shows a sketch of the curve with equation $y = \dfrac{2+3\sqrt{x}}{x^2}$.



The region R is bounded by the x axis and the lines $x = 1$ and $x = 3$.

Calculate the area of R.

Give your answer in the form $p + q\sqrt{3}$, where p, q are constants to be found. **(6)**

Question 1 continued

TOTAL 6 MARKS

2 By considering the binomial expansion of

$$(1+x)^5$$

show that $(0.0712)^5$ is approximately 1.51×10^{-9}. **(7)**

Question 2 continued

TOTAL 7 MARKS

3 Solve

$$\log_3\left(x^2-5x+6\right)=\log_3\left(2x^2+26x+60\right)+2$$

(5)

Question 3 continued

TOTAL 5 MARKS

4 The curve C has equation

$$y = \frac{x^4}{2} - 64x^2 + 5$$

(a) Find the x coordinates of the stationary points on C. **(4)**

(b) Determine the nature of these stationary points. **(3)**

Question 4 continued

TOTAL 7 MARKS

5

$$U_1 : a + ar + ar^2 + ar^3 + ...$$

$$U_2 : 2a + \frac{2a}{s} + \frac{2a}{s^2} + \frac{2a}{s^3} + ...$$

(a) State, in terms of r and n, the sum of the first n terms of U_1. **(1)**

(b) Find, in terms of s, the sum to infinity of U_2. **(3)**

Given that the sum of the first n terms of U_1 is four times larger than the sum to infinity of U_2,

(c) Find s in terms of r. **(4)**

Question 5 continued

TOTAL 8 MARKS

6 (a) Find a factor of $2x^3 + 3x^2 - 8x + 3$ **(2)**

(b) Hence, express $2x^3 + 3x^2 - 8x + 3$ as a product of three linear factors. **(5)**

(c) Solve, for $0 < \theta \leq 2\pi$,

$$4\sin^3 2\theta + 6\sin^2 2\theta - 16\sin 2\theta = -6$$

Give your answers in terms of π. **(6)**

Question 6 continued

Question 6 continued

Question 6 continued

TOTAL 13 MARKS

7 A circle C has the equation $(x-2)^2+(y-4)^2=5^2$.

The tangent T to the circle touches the circle at the point $P(6,7)$.

(a) Work out the equation of the line T. **(5)**

(b) Show, by sketching, that T does not intersect C a second time. **(2)**

(c) Prove **algebraically** that T does not intersect C a second time. **(5)**

Question 7 continued

Question 7 continued

Question 7 continued

TOTAL 12 MARKS

8 A triangle has sides $a+b$, a and $a-b$, where $a>b>0$.

Let α and β denote the largest and smallest angles of the triangle respectively.

(a) By the use of the cosine rule, show that

$$\cos\alpha = \frac{a-4b}{2(a-b)}$$

(3)

(b) By the use of the cosine rule, show also that

$$\cos\beta = \frac{a+4b}{2(a+b)}$$

(3)

Given that $\cos\beta = \frac{3}{4}$,

(c) Find a in terms of b. **(3)**

(d) Hence, find the ratio of the lengths of the sides of the triangle. **(2)**

Question 8 continued

Question 8 continued

Question 8 continued

TOTAL 11 MARKS

9 (a) Show that

$$\frac{3\cdot 2^x\cdot 12^{2x}-5\cdot 4^x\cdot 6^{2x}}{2^x\cdot 6^{2x}}=3\cdot 2^{2x}-5\cdot 2^x \qquad \textbf{(3)}$$

(b) Hence, or otherwise, solve

$$\frac{3\cdot 2^x\cdot 12^{2x}-5\cdot 4^x\cdot 6^{2x}}{2^x\cdot 6^{2x}}=2 \qquad \textbf{(3)}$$

Question 9 continued

TOTAL 6 MARKS