AQA – Further calculus – AS Further Mathematics P1

1. June/2020/Paper_1/No.12

   The mean value of the function f over the interval $1 \le x \le 5$ is m.

   The graph of $y = g(x)$ is a reflection in the x-axis of $y = f(x)$.

   The graph of $y = h(x)$ is a translation of $y = g(x)$ by $\begin{bmatrix} 3 \\ 7 \end{bmatrix}$

   Determine, in terms of m, the mean value of the function h over the interval $4 \le x \le 8$

   [2 marks]

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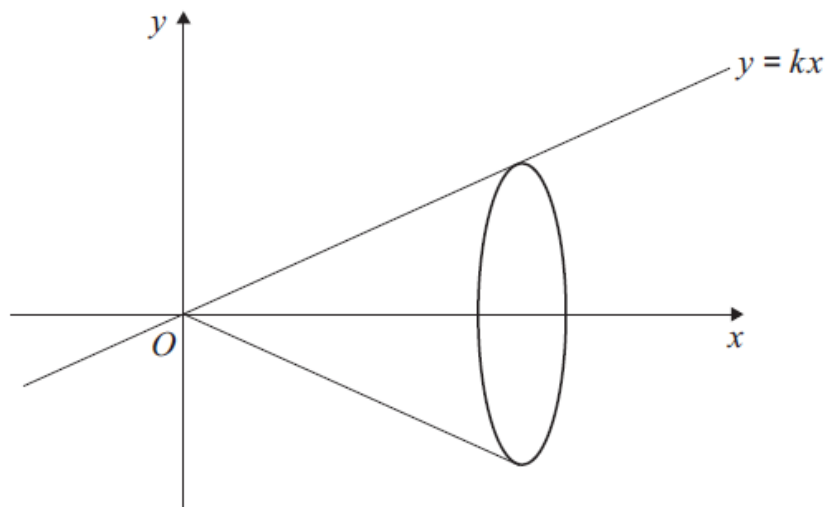
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2. June/2020/Paper_1/No.15

A segment of the line $y = kx$ is rotated about the x-axis to generate a cone with vertex O.

The distance of O from the centre of the base of the cone is h.

The radius of the base of the cone is r.

(a)   Find k in terms of r and h.

[1 mark]

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2. June/2020/Paper_1/No.15

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(b)   Use calculus to prove that the volume of the cone is

$$\frac{1}{3}\pi r^2 h$$

[3 marks]

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Use calculus to prove that the volume of the cone is

$$\frac{1}{3}\pi r^2 h$$

[3 marks]