

**AQA – Exponentials and logarithms – AS Mathematics P1****1. June/2020/Paper\_1/No.10**

Raj is investigating how the price,  $P$  pounds, of a brilliant-cut diamond ring is related to the weight,  $C$  carats, of the diamond.

He believes that they are connected by a formula

$$P = aC^n$$

where  $a$  and  $n$  are constants.

(a) Express  $\ln P$  in terms of  $\ln C$ .

[2 marks]

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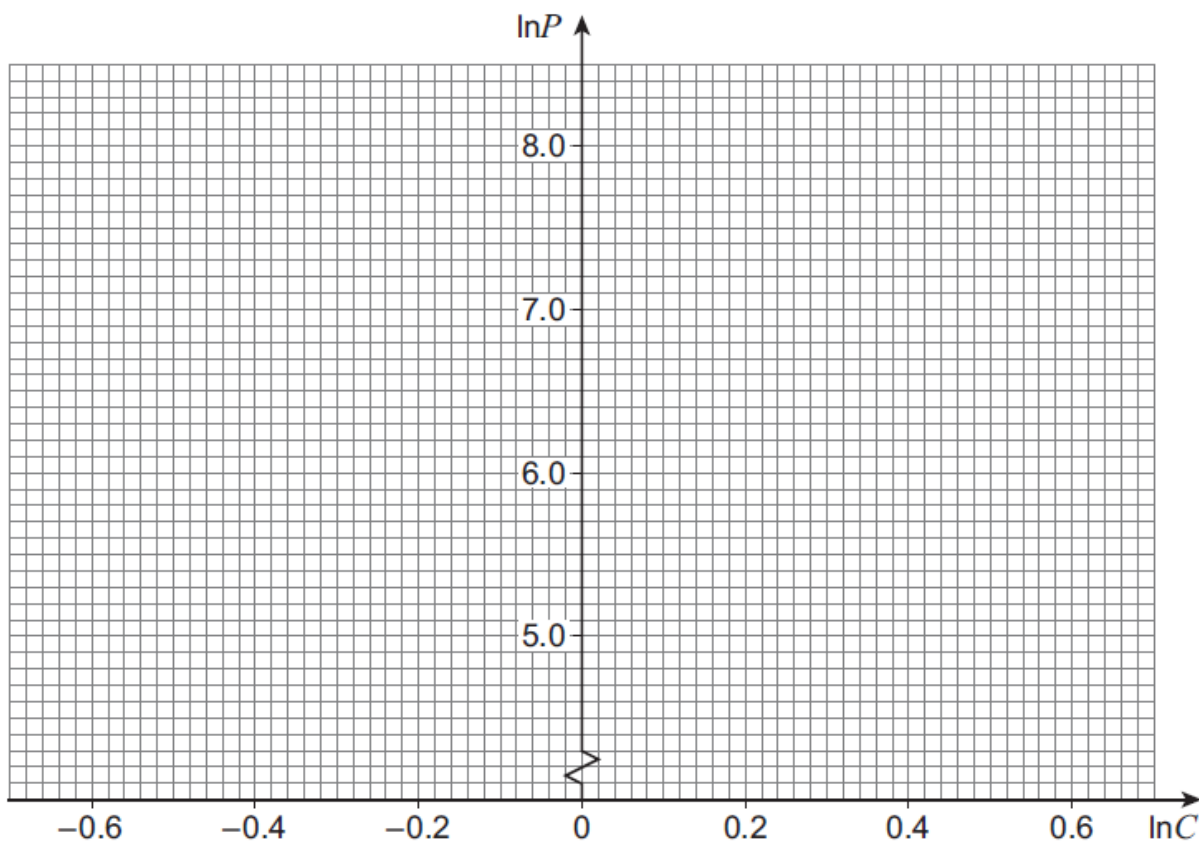
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(b) Raj researches the price of three brilliant-cut diamond rings on a website with the following results.

$C$	0.60	1.15	1.50
$P$	495	1200	1720

(b) (i) Plot  $\ln P$  against  $\ln C$  for the three rings on the grid below.

[2 marks]



(b) (ii) Explain which feature of the plot suggests that Raj's belief may be correct.

[1 mark]

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(d) Raj wants to buy a ring with a brilliant-cut diamond of weight 2 carats.

Estimate the price of such a ring.

[2 marks]

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