

Ironically, if someone ignored that rule of thumb and used their answer from part (b), calculating $\frac{-22400}{\sqrt{1490000 \times 371.56}}$, they would get

0.95200758158056683856814884512488, which is correct to 3 sig figs rather than 4, but that is purely a coincidence! (Unless Edexcel carefully chose the numbers so that people using an inherently dangerous method could still be given full marks.)

If someone used 5-digit accuracy for all three inputs to the calculation, they would get

$$\frac{-22409}{\sqrt{1491200 \times 371.56}} = -0.95200680333763843815766087866153$$

which is again correct to 4 s.f., proving that the 5 s.f. accuracy obtained by using 3-sf inputs really was just a lucky fluke!

(c) The pmcc is close to -1 (the largest possible negative correlation), so supports using linear regression. ✓

$$(d) \quad b = \frac{S_{th}}{S_{hh}} = \frac{-22408\frac{8}{9}}{1491222\frac{2}{9}} = -\frac{201680}{13421000} \\ = -0.01502719618508307875717159675136 \quad \checkmark$$

$$\text{Sub in } \bar{t} = a + b\bar{h} : \frac{110}{9} = a - \frac{20168}{1342100} \cdot \frac{7150}{9}$$

$$\therefore a = \frac{1}{9} \left(110 + 7150 \times \frac{20168}{1342100} \right) \\ = 24.160494747038223679308546308025 \quad \checkmark$$

So $t = 24.16 - 0.015027h$, approximately. (Ans) ✓