

10. The heptathlon is an athletics contest made up of seven events.

Athletes score points for each event.

In the 200 metres event, the points are calculated using the formula

$$P = 4.99087(42.5 - T)^{1.81}$$

where P is the number of points awarded, and T is the athlete's time, in seconds.

- (a) Calculate how many points would be awarded for a time of 24.55 seconds in the 200 metres event.

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In the long jump event, the points are calculated using the formula

$$P = 0.188807(D - 210)^k$$

where P is the number of points awarded, D is the distance jumped, in centimetres, and k is a constant.

- (b) Given that 850 points are awarded for a jump of 600 cm, calculate the value of k .

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