This test is designed to check a learner's skills and knowledge in this topic. It should be completed without any outside assistance and should take no longer than 30 minutes. After completion, the Mark Scheme will help you decide what intervention is needed.

**1** Estimate, to two significant figures, the quantity $\dfrac{1.5^2}{\sqrt{\frac{1}{2}\times 21.5}}$ .     **(1 mark)**

**2** Estimate, to two decimal places, the quantity $\dfrac{1}{2}\times 6.5\times 2.5^2$.     **(1 mark)**

**3** Find the gradient of the slope in the following graph (do not worry about units).     **(3 marks)**
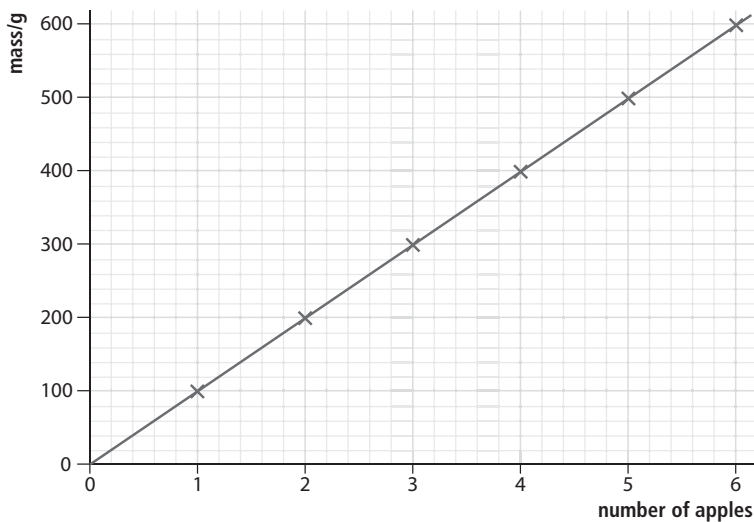


**4** Use Pythagoras' theorem to calculate the length of the resultant in the following figure.     **(3 marks)**
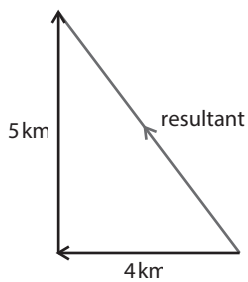


**5** Convert the speed of a car travelling at 120 km h$^{-1}$ into m s$^{-1}$.     **(1 mark)**

**6** Convert the speed of a person walking at 1 m s$^{-1}$ into km h$^{-1}$.     **(1 mark)**

**7** A sprinter runs 200 metres in 25 seconds. Calculate their average speed in m s$^{-1}$.     **(2 marks)**

**8** A jet can travel at 425 m s$^{-1}$. Calculate how far it will travel at this speed in:
    **a** 1 second     **(1 mark)**
    **b** 1 minute     **(2 marks)**
    **c** 1 hour.     **(2 marks)**

**9**   A tortoise crawls at a speed of 0.02 m s$^{-1}$. How long, in seconds, will it take to reach the end of a 12 m garden?    **(2 marks)**

**10**   A sports car accelerates uniformly from rest to 35 m s$^{-1}$ in 7 seconds. Calculate the acceleration of the car.    **(1 mark)**

**11**   A plane starting from rest accelerates at 5 m s$^{-2}$ for 30 seconds. Calculate the increase in velocity, in m s$^{-1}$, after:
   **a**   1 s      **(1 mark)**
   **b**   5 s      **(1 mark)**
   **c**   30 s.      **(1 mark)**

**12**   Consider the following displacement–time graphs below, showing four different objects in motion.
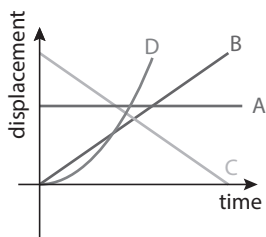


In which graph is the object:
   **a**   not moving      **(1 mark)**
   **b**   accelerating      **(1 mark)**
   **c**   moving at a positive constant velocity      **(1 mark)**
   **d**   moving at a negative velocity?      **(1 mark)**

**Total Marks: 27**