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| **Harder Speed Calculations** |
| **(a)** | **(b)** | **(c)** |
| A tractor travels at 12 mph for 10 minutes and then at 20 mph for 15 minutes. Calculate the average speed of the tractor across the whole journey. | A train travels 320 km from Manchester to London in 2 hours 5 minutes. Initially, the train travels at 180 km/h for 50 minutes. It then travels at a constant speed $s$ for the rest of the journey. Find $s$ in km/h. | Riya walks from home to school in 24 minutes at a speed of 4 km/h. She then jogs back home and is 9 minutes quicker than when she walked. What is Riya’s average speed jogging home?  |
| **(d)** | **(e)** | **(f)** |
| Liverpool is 120 km from Leeds. A car sets off from Liverpool travelling at 80 km/h. A lorry sets off from Leeds travelling at 70 km/h. How far from Liverpool are the two vehicles when they pass each other? | Ayesha goes for the same run every morning. She normally runs at 7.5 km/h but finds that when she increases her speed to 8 km/h, she completes the run 2 minutes quicker. How far does Ayesha run? | Train A leaves the station at 9.24 am travelling at 126 km/h. Train B leaves the same station at 9.32 am, travelling along the same line at 140 km/h. At what time will train B catch up to train A? |
| **(g)** | **(h)** | **(i)** |
| Theo travels from home to work at a constant speed of 50 km/h. At the end of the day, he travels from work to home at a constant speed of 30 km/h. Calculate his average speed across both journeys. | A taxi travels at $x$ km/h for 15 minutes, then at $3x$ km/h for 10 minutes and finally at $2x$ km/h for 5 minutes. Find the average speed of the taxi across the whole journey in terms of $x$. | Yusuf runs a 400 m race. He sets off at $x$ m/s and runs at this speed for 50 seconds before increasing his speed by 25% to run for the remaining 30 seconds. Find the value of $x$. |