Age 14+ Level ★★★
Worksheet 1

1. **Televisual Technology**
   The width : height ratio of television screens changed from 'traditional' $4:3$ to 'widescreen' $16:9$.

   If a traditional screen and a widescreen have the same area, then what is the ratio
   widescreen width : traditional width?

2. **Late for Work**
   Every day, Ms Fanthorpe leaves home at 8:30 and drives to work. If she drives at an average speed of 20 miles per hour, she arrives 3 minutes late. If she drives at an average speed of 30 miles per hour, she arrives 3 minutes early.

   What average speed should she drive at to arrive on time?

3. **Walk up the Escalator**
   Every day, Aimee goes up an escalator on her journey to work. If she stands still, it takes her 60 seconds to travel from the bottom to the top. One day the escalator was broken so she had to walk up it. This took her 90 seconds.

   How many seconds would it take her to travel up the escalator if she walked up at the same speed as before while it was working?

4. **Day Out**
   Chris planned a 210 km bike ride.
   He rode 5 km/h faster than he planned and finished his ride 1 hour earlier than he planned.

   His average speed for the ride was x km/h.
   What is the value of x?

5. **Boys and Girls**
   In September, the ratio of boys to girls in a school was 3:2.

   By June, there were 80 fewer boys and 20 fewer girls in the school, and the ratio of boys to girls was 7:5.

   What was the total number of students in the school in September?

These problems are adapted from UKMT (ukmt.org.uk) and SEAMC (seamc.asia) problems.