Problem of the Week
Problem A and Solution
Video Viewing

Problem

Jo likes to watch videos. Sometimes she watches them at normal speed. However, she also has the option to watch them at $\frac{1}{4}$ as fast as normal speed, $\frac{1}{2}$ as fast as normal speed, or 2 times as fast as normal speed. The table below lists the normal play times for four videos and the speed at which Jo watches each one.

	Normal Speed Time	Speed Jo Watches Video At
Video A	50 seconds	$\frac{1}{4}$ speed
Video B	2 minutes 15 seconds	normal speed
Video C	1 minute 40 seconds	$\frac{1}{2}$ speed
Video D	6 minutes 20 seconds	2 times speed

What is the total time Jo spent watching these four videos?

Solution

If a video is playing at $\frac{1}{4}$ speed, then it will take 4 times as long to play as normal speed. So a 50 second video will take $50 \times 4 = 200$ seconds to watch.

If a video is playing at $\frac{1}{2}$ speed, then it will take 2 times as long to play as normal speed. So a 1 minute and 40 second video will take 2 minutes and $40 \times 2 = 80$ seconds to watch.

If a video is playing at 2 times speed then it will take half as long to play as normal speed. Half of 6 minutes is 3 minutes and half of 20 seconds is 10 seconds.

Now we can add up all the minutes and seconds of playing times of all four videos:

$$2 + 2 + 3 = 7 \text{ minutes and } 200 + 15 + 80 + 10 = 305 \text{ seconds}$$

There are 60 seconds in 1 minute. When we skip count by 60, we get 60, 120, 180, 240, 300. Thus, there are 5 minutes in 305 seconds with $305 - 300 = 5$ seconds left over.

So Jo spent $7 + 5 = 12$ minutes and 5 seconds watching these four videos.