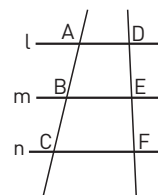


YOU & MATHS In the figure, if $l \parallel m \parallel n$, $\overline{AB} = 5$, $\overline{AC} = 10$, $\overline{DE} = 3x + 4$, and $\overline{DF} = 10x - 4$, then:

- ☐ A $DE = 5$ units and $DF = 10$ units.
- ☐ B $DE = \left(7 + \frac{3}{7}\right)$ units.
- ☐ C $DE = \left(6 + \frac{2}{7}\right)$ units.
- ☐ D $DE = 3$ units.
- ☐ E None of the answers.



(USA Northern State University: 50th Annual Mathematics Contest, 2003)

This problem can be quickly solved by applying the intercept theorem (Thales' theorem). As l , m and n are parallel, then it holds that:

$$\overline{AB} : \overline{AC} = \overline{DE} : \overline{DF}.$$

We substitute the measures given by the problem in the relationship above and get:

$$5 : 10 = (3x + 4) : (10x - 4) \rightarrow 10(3x + 4) = 5(10x - 4) \rightarrow 2(3x + 4) = 10x - 4 \rightarrow$$

dividing both sides by 5

$$6x + 8 = 10x - 4 \rightarrow 4x = 12 \rightarrow x = 3.$$

Plugging this figure into the expressions for \overline{DE} and \overline{DF} , we obtain:

$$\overline{DE} = 3x + 4 = 3 \cdot 3 + 4 = 13;$$

$$\overline{DF} = 10x - 4 = 10 \cdot 3 - 4 = 26.$$

These numbers are different from the ones that appear in the available choices. Therefore our final answer is E.