

Topic: Line segments, parallel, perpendicular or neither

Question: Each pair of points in the table below are points that lie on the given line. Which two lines are perpendicular to each other?

Line	Point 1	Point 2
\overleftrightarrow{AB}	$(-2, 2)$	$(1, 8)$
\overleftrightarrow{CD}	$(3, 6)$	$(5, 2)$
\overleftrightarrow{EF}	$(3, 0)$	$(7, -2)$

Answer choices:

A \overleftrightarrow{AB} and \overleftrightarrow{CD}

B \overleftrightarrow{CD} and \overleftrightarrow{EF}

C \overleftrightarrow{AB} and \overleftrightarrow{EF}

D None are perpendicular.

Solution: C

Use the slope formula

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

for each line.

$$\overleftrightarrow{AB}: m = \frac{8 - 2}{1 - (-2)} = 2$$

$$\overleftrightarrow{CD}: m = \frac{2 - 6}{5 - 3} = -2$$

$$\overleftrightarrow{EF}: m = \frac{-2 - 0}{7 - 3} = -\frac{1}{2}$$

\overleftrightarrow{AB} and \overleftrightarrow{EF} have slopes that are negative reciprocals, so they are perpendicular.

Topic: Line segments, parallel, perpendicular or neither

Question: Each pair of points in the table below are points that lie on the given line. Which lines are parallel to each other?

Line	Point 1	Point 2
\overleftrightarrow{AB}	(0, 3)	(6, 7)
\overleftrightarrow{CD}	(5, 4)	(8, 6)
\overleftrightarrow{EF}	(1, -2)	(7, 2)

Answer choices:

A \overleftrightarrow{AB} and \overleftrightarrow{CD}

B \overleftrightarrow{CD} and \overleftrightarrow{EF}

C \overleftrightarrow{AB} and \overleftrightarrow{EF}

D All three are parallel.

Solution: D

Use the slope formula

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

for each line.

$$\overleftrightarrow{AB}: m = \frac{7 - 3}{6 - 0} = \frac{2}{3}$$

$$\overleftrightarrow{CD}: m = \frac{6 - 4}{8 - 5} = \frac{2}{3}$$

$$\overleftrightarrow{EF}: m = \frac{2 - (-2)}{7 - 1} = \frac{2}{3}$$

All three lines have the same slope, so all three are parallel.