

Coordinate Geometry Mastery

Practice Worksheet (Compact Layout)

I DO

Point A has coordinates $(2, 9)$.

Point B has coordinates $(10, 3)$.

Work out the exact length of the line segment AB .

WE DO

Point C has coordinates $(-3, 5)$.

Point D has coordinates $(2, 17)$.

Work out the exact length of the line segment CD .

YOU DO 1

Point E has coordinates $(1, -4)$.

Point F has coordinates $(16, 4)$.

Work out the exact length of the line segment EF .

YOU DO 2

Point G has coordinates $(-2, 6)$.

Point H has coordinates $(4, -2)$.

Work out the exact length of the line segment GH .

CHALLENGE

Point M has coordinates $(3, k)$.

Point N has coordinates $(8, -2)$.

The exact length of the line segment MN is 13.

Find the two possible values of k .

ANSWERS & WORKED SOLUTIONS**I Do**

Step 1: Find the difference in x-coordinates: $10 - 2 = 8$.

Step 2: Find the difference in y-coordinates: $3 - 9 = -6$.

Step 3: Apply Pythagoras' theorem: Length = $\sqrt{8^2 + (-6)^2}$.

Step 4: Calculate: $\sqrt{64 + 36} = \sqrt{100}$. **Answer: 10**

We Do

Step 1: Difference in x: $2 - (-3) = 5$.

Step 2: Difference in y: $17 - 5 = 12$.

Step 3: Length = $\sqrt{5^2 + 12^2}$.

Step 4: Calculate: $\sqrt{25 + 144} = \sqrt{169}$. **Answer: 13**

You Do 1

Step 1: Difference in x: $16 - 1 = 15$.

Step 2: Difference in y: $4 - (-4) = 8$.

Step 3: Length = $\sqrt{15^2 + 8^2}$.

Step 4: Calculate: $\sqrt{225 + 64} = \sqrt{289}$. **Answer: 17**

ANSWERS & WORKED SOLUTIONS (CONTINUED)

You Do 2

Step 1: Difference in x: $4 - (-2) = 6$.

Step 2: Difference in y: $-2 - 6 = -8$.

Step 3: Length = $\sqrt{6^2 + (-8)^2}$.

Step 4: Calculate: $\sqrt{36 + 64} = \sqrt{100}$. **Answer: 10**

Challenge

Step 1: Set up Pythagoras: $\sqrt{[(8 - 3)^2 + (-2 - k)^2]} = 13$.

Step 2: Simplify and square both sides: $5^2 + (-2 - k)^2 = 169 \rightarrow 25 + (-2 - k)^2 = 169$.

Step 3: Subtract 25: $(-2 - k)^2 = 144$.

Step 4: Square root both sides: $-2 - k = \pm 12$.

Step 5: Solve for k: $-k = 14 \rightarrow k = -14$. OR $-k = -10 \rightarrow k = 10$. **Answer: k = 10, k = -14**