

Finding Distance Between Points on a Grid

Grade 8 math · Worksheet Answer Key · Standards: 8.G.B.8

Each solution lists the two legs, applies the distance formula, and states the length with units. Check that the horizontal and vertical differences match the figure, and keep roots exact until the final rounding step.

Standards: 8.G.B.8 · **Level:** Grade 8

Problem 1 Across a row

The y-coordinates match, so subtract the x-coordinates: $|5 - (-7)| = 12$.

The distance is **12 units**.

Problem 2 Down a column

The x-coordinates match: $|9 - (-6)| = 15$.

The distance is **15 units**.

Problem 3 From the origin

$$d = \sqrt{(36^2 + 77^2)} = \sqrt{(1,296 + 5,929)} = \sqrt{7,225} = 85.$$

The distance is **85 units**.

Problem 4 Not a whole number

Legs: $2 - (-4) = 6$ and $-2 - 7 = -9$, so the vertical leg is 9.

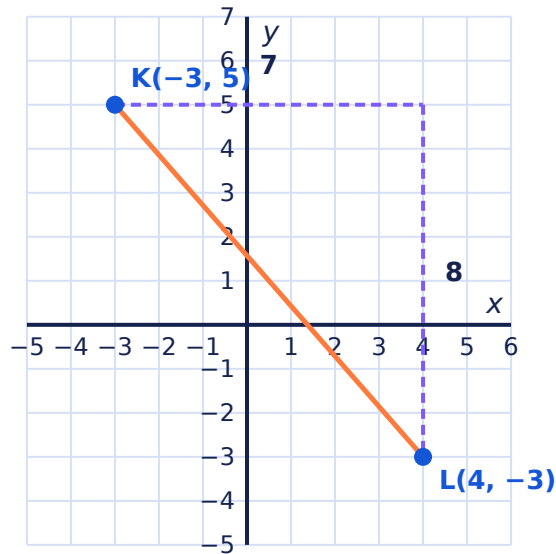
$$d = \sqrt{(36 + 81)} = \sqrt{117} \approx 10.82.$$

The distance is about **10.8 units**.

Problem 5 Read the graph

K(-3, 5) and L(4, -3). Horizontal leg: 7. Vertical leg: 8.

$$d = \sqrt{(49 + 64)} = \sqrt{113} \approx 10.63.$$



Legs 7 and 8, so $KL = \sqrt{113}$.

$\sqrt{113} \approx 10.6$ units

Problem 6 Twenty units

Legs: $10 - (-6) = 16$ and $9 - (-3) = 12$.

$$d = \sqrt{(256 + 144)} = \sqrt{400} = 20.$$

20 units

Problem 7 Equal legs

Legs: $|-4 - 2| = 6$ and $|-1 - (-7)| = 6$.

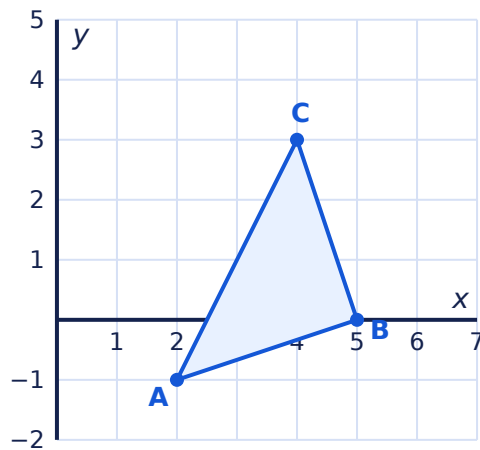
$$d = \sqrt{(36 + 36)} = \sqrt{72} = 6\sqrt{2} \approx 8.49.$$

$6\sqrt{2} \approx 8.5$ units

Problem 8 Right triangle on a grid

$$AB^2 = 3^2 + 1^2 = 10. \quad BC^2 = 1^2 + 3^2 = 10. \quad AC^2 = 2^2 + 4^2 = 20.$$

$$AB^2 + BC^2 = 10 + 10 = 20 = AC^2.$$



Triangle ABC.

Yes, it is a right triangle with the right angle at B

Problem 9 Perimeter of a rectangle

Width: $4 - (-2) = 6$. Height: $2 - (-3) = 5$.

Perimeter: $2(6 + 5) = 22$.

22 units

Problem 10 Perimeter of a triangle

Horizontal side: 5. Vertical side: 12. Slanted side: $\sqrt{25 + 144} = \sqrt{169} = 13$.

Perimeter: $5 + 12 + 13 = 30$.

30 units

Problem 11 Triangle perimeter from a graph

DE = 6 and EF = 5 by counting. DF = $\sqrt{6^2 + 5^2} = \sqrt{61} \approx 7.81$.

Perimeter: $6 + 5 + 7.81 = 18.81$.

About 18.8 units

Problem 12 Find the missing coordinate

$(x - 2)^2 + (9 - 1)^2 = 10^2$, so $(x - 2)^2 + 64 = 100$.

$$(x - 2)^2 = 36, \text{ so } x - 2 = 6 \text{ or } x - 2 = -6.$$

$$x = 8 \text{ or } x = -4$$

Problem 13 Isosceles check

$$AB = 6. AC = \sqrt{(3^2 + 6^2)} = \sqrt{45}. BC = \sqrt{(3^2 + 6^2)} = \sqrt{45}.$$

AC = BC, so the triangle is isosceles.

$$\text{Perimeter: } 6 + 2\sqrt{45} = 6 + 13.42 = 19.42.$$

Isosceles; perimeter $\approx$ 19.4 units

Problem 14 Trapezoid perimeter

$$AB = 4 \text{ (horizontal)}. DA = 4 \text{ (vertical)}. CD = 7 \text{ (horizontal)}.$$

$$BC = \sqrt{((4 - 1)^2 + (2 - (-2))^2)} = \sqrt{(9 + 16)} = 5.$$

$$\text{Perimeter: } 4 + 5 + 7 + 4 = 20.$$

20 units

Problem 15 Which is closer?

$$OA^2 = 49 + 25 = 74. OB^2 = 36 + 36 = 72.$$

Since 72 is less than 74, B is closer ($\sqrt{72} \approx 8.49$ compared with $\sqrt{74} \approx 8.60$).

Point B is closer

Problem 16 Hiking map

$$\text{Legs: } 3 - (-5) = 8 \text{ and } 2 - (-3) = 5.$$

$$d = \sqrt{(64 + 25)} = \sqrt{89} \approx 9.43.$$

About 9.4 miles

Problem 17 Drone delivery

$$\text{Legs: } 9 - (-6) = 15 \text{ and } 6 - (-2) = 8.$$

$$d = \sqrt{(225 + 64)} = \sqrt{289} = 17 \text{ units.}$$

$$17 \cdot 0.25 = 4.25.$$

4.25 miles

Problem 18 Garden fence

Sides in units: 8, 15, and $\sqrt{64 + 225} = 17$. Perimeter: $8 + 15 + 17 = 40$ units.

$40 \cdot 2 = 80$ feet, and $80 \cdot \$3.50 = \$280$.

\$280

Problem 19 Robot route

$AB = \sqrt{3^2 + 6^2} = \sqrt{45} \approx 6.71$. $BC = \sqrt{6^2 + 6^2} = \sqrt{72} \approx 8.49$.

Route: $6.71 + 8.49 = 15.19$. Straight path $AC = 4 - (-5) = 9$.

Savings: $15.19 - 9 = 6.19$.

Route ≈ 15.2 units; the straight path is about 6.2 units shorter

Problem 20 Rhombus on the grid

$WX = \sqrt{5^2 + 2^2} = \sqrt{29}$. $XY = \sqrt{5^2 + 2^2} = \sqrt{29}$. $YZ = \sqrt{5^2 + 2^2} = \sqrt{29}$. $ZW = \sqrt{5^2 + 2^2} = \sqrt{29}$.

All sides equal $\sqrt{29} \approx 5.385$.

Perimeter: $4\sqrt{29} \approx 21.54$.

All sides are $\sqrt{29}$; perimeter ≈ 21.5 units