

Grade 8 · Distance in the Coordinate Plane · Worksheet Answer Key

Common Core 8.G.B.8 · mathovore.fr

Each solution finds the horizontal and vertical legs first, squares them, adds, and takes the square root. Rounded answers are given to the nearest tenth. When an answer differs, recheck the signs of the subtraction, since the absolute value of each leg is what matters.

Grade 8 Common Core: 8.G.B.8

Problem 1: Horizontal distance

Both points have $y = 5$, so the segment is horizontal. $|9 - 2| = 7$.

The distance is **7 units**.

Problem 2: Vertical distance

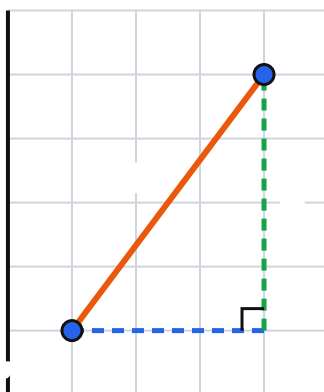
Both points have $x = -3$, so the segment is vertical. $|6 - (-4)| = 10$.

The distance is **10 units**.

Problem 3: Draw the legs

Horizontal leg: $4 - 1 = 3$. Vertical leg: $5 - 1 = 4$. Then $d^2 = 3^2 + 4^2 = 9 + 16 = 25$.

$AB = 5$ units.



Legs 3 and 4, hypotenuse 5.

Problem 4: Distance from the origin

The legs are 5 and 12. $d^2 = 5^2 + 12^2 = 25 + 144 = 169$.

$d = 13$ units.

Problem 5: Two points in Quadrant I

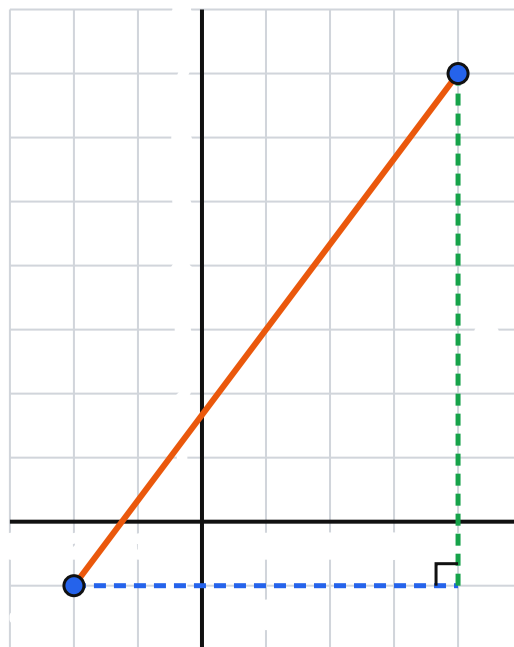
Legs: $10 - 2 = 8$ and $9 - 3 = 6$. $d^2 = 64 + 36 = 100$.

$d = 10$ units.

Problem 6: Across quadrants

Legs: $4 - (-2) = 6$ and $7 - (-1) = 8$. $d^2 = 36 + 64 = 100$.

$d = 10$ units.



Legs 6 and 8.

Problem 7: Moving down and right

Legs: $5 - (-7) = 12$ and $|-2 - 3| = 5$. $d^2 = 144 + 25 = 169$.

$d = 13$ units.

Problem 8: Distance that is not whole

Legs: $5-1=4$ and $6-1=5$. $d^2=16+25=41$, so $d=\sqrt{41}$.

$\sqrt{41} \approx 6.40$, so the distance is about **6.4 units**.

Problem 9: Larger legs

Legs: $2-(-3)=5$ and $|-6-4|=10$. $d^2=25+100=125$.

$d=\sqrt{125} \approx 11.18$, so the distance is about **11.2 units**.

Problem 10: Use the distance formula

$$d = \sqrt{(7-(-8))^2 + (5-(-3))^2} = \sqrt{15^2 + 8^2} = \sqrt{225 + 64} = \sqrt{289}.$$

$d=17$ units.

Problem 11: Find the error

Liam added the legs. The distance is the hypotenuse, so the legs must be squared, added, and then the square root is taken.

$d^2=3^2+4^2=25$, so $d=5$. The distance is 5 units, not 7.

Problem 12: Which point is closer?

$$OP = \sqrt{5^2 + (-6)^2} = \sqrt{61} \approx 7.8. \quad OQ = \sqrt{(-7)^2 + 3^2} = \sqrt{58} \approx 7.6.$$

Since 58 is less than 61, **point Q** is closer to the origin.

Problem 13: Missing coordinate

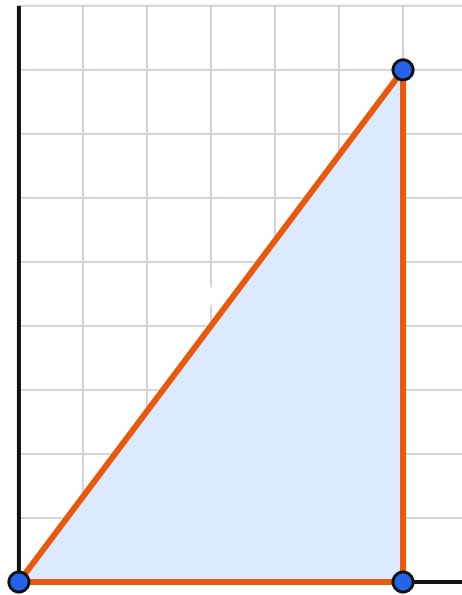
The horizontal leg is $7-1=6$. So $6^2+(y-2)^2=10^2$, which gives $(y-2)^2=100-36=64$.

Then $y-2=8$, so $y=10$.

Problem 14: Perimeter of a grid triangle

Bottom side: 6. Right side: 8. Slanted side: $\sqrt{6^2+8^2}=\sqrt{100}=10$.

Perimeter: $6+8+10=24$ units.

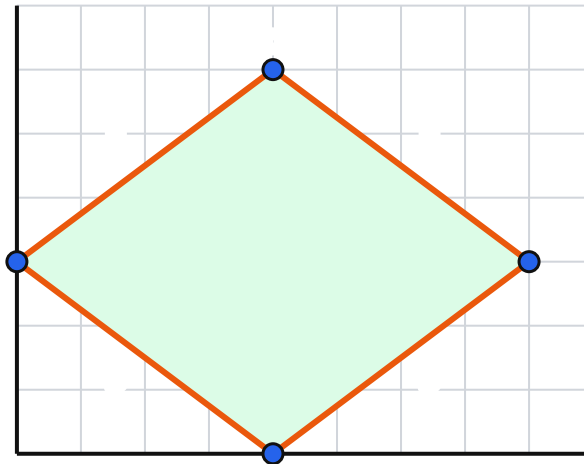


Sides 6, 8 and 10.

Problem 15: Perimeter of a rhombus

Each side has legs 4 and 3, so each side is $\sqrt{4^2+3^2} = \sqrt{25} = 5$.

All four sides are 5, so the perimeter is $4 \cdot 5 = \mathbf{20 \text{ units}}$.



Four sides of length 5.

Problem 16: Perimeter with a slanted side

Horizontal side: $2 - (-4) = 6$. Vertical side: $3 - 0 = 3$. Slanted side: $\sqrt{6^2+3^2} = \sqrt{45} \approx 6.71$.

Perimeter: $6+3+6.71 \approx \mathbf{15.7 \text{ units}}$.

Problem 17: Is the triangle isosceles?

$$AB = |5 - 1| = 4. \quad AC = \sqrt{2^2 + 4^2} = \sqrt{20}. \quad BC = \sqrt{(-2)^2 + 4^2} = \sqrt{20}.$$

Two sides have the same length $\sqrt{20} \approx 4.5$, so the triangle **is isosceles**.

Problem 18: Is the triangle a right triangle?

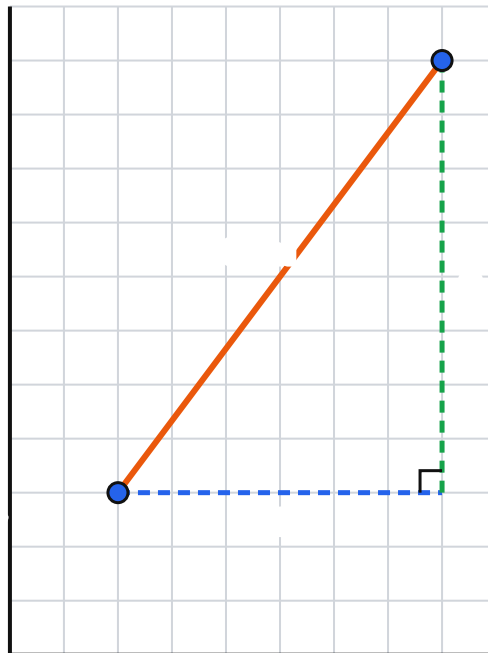
$$AB^2 = 3^2 + 4^2 = 25. \quad BC^2 = 4^2 + (-3)^2 = 25. \quad AC^2 = 7^2 + 1^2 = 50.$$

Check the converse: $AB^2 + BC^2 = 25 + 25 = 50 = AC^2$, so the triangle **is a right triangle** with the right angle at B .

Problem 19: Library to park

$$\text{Legs: } 8 - 2 = 6 \text{ miles and } 11 - 3 = 8 \text{ miles. } d^2 = 36 + 64 = 100.$$

They are **10 miles** apart.



Legs 6 and 8.

Problem 20: Drone flight

$$\text{Legs: } 8 - (-4) = 12 \text{ and } 2 - (-3) = 5. \quad d^2 = 144 + 25 = 169.$$

The drone flies **13 yards**.

Problem 21: Home to school

Legs: $6 - (-3) = 9$ and $|-10 - 2| = 12$. $d^2 = 81 + 144 = 225$, so $d = 15$ units.

Each unit is 0.1 mile: $15 \times 0.1 = \mathbf{1.5 \text{ miles}}$.

Problem 22: Fence for a garden

Sides: 9 ft, 12 ft and $\sqrt{9^2 + 12^2} = \sqrt{225} = 15$ ft. Perimeter: $9 + 12 + 15 = 36$ ft.

Cost: $36 \times 3.50 = \mathbf{\$126}$.

Problem 23: Jogging loop

Two sides are 5 blocks. The slanted side is $\sqrt{5^2 + 5^2} = \sqrt{50} \approx 7.07$.

Loop: $5 + 5 + 7.07 \approx \mathbf{17.1 \text{ blocks}}$.

Problem 24: Video game character

Legs: $6 - (-6) = 12$ and $3 - (-2) = 5$. $d^2 = 144 + 25 = 169$, so $d = 13$ units.

Time: $13 \div 2.6 = \mathbf{5 \text{ seconds}}$.