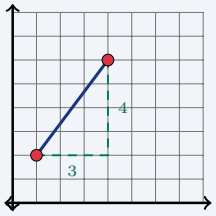
Finding the Distance Between Two Points

Name: _____	Date: _____	Score: _____ / 18

Quick Review and Helpful Hints

The distance between two points comes from the Pythagorean theorem: $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$. Find the horizontal change and the vertical change, square each, add them, then take the square root. Simplify the radical when possible.

▷ **Example:** Find the distance between $(1, 2)$ and $(4, 6)$.
Work: Horizontal change: $4 - 1 = 3$. Vertical change: $6 - 2 = 4$.
Then $d = \sqrt{3^2 + 4^2} = \sqrt{9 + 16} = \sqrt{25}$. ★ **Answer:** $d = 5$



$d = \sqrt{3^2 + 4^2} = 5.$

Practice Problems

Find the distance between each pair of points. Simplify radicals.

1. $(0, 0)$ and $(3, 4)$ _____

2. $(0, 0)$ and $(6, 8)$ _____

3. $(1, 1)$ and $(4, 5)$ _____

4. $(2, 3)$ and $(2, 9)$ _____

5. $(1, 2)$ and $(7, 2)$ _____

6. $(0, 0)$ and $(5, 12)$ _____

7. $(-1, -1)$ and $(2, 3)$ _____

8. $(0, 0)$ and $(1, 1)$ _____

9. $(2, 2)$ and $(5, 6)$ _____

10. $(0, 0)$ and $(2, 2)$ _____

11. $(1, 1)$ and $(4, 1)$ _____

12. $(-2, 0)$ and $(1, 4)$ _____

13. $(0, 0)$ and $(8, 6)$ _____

14. $(3, 1)$ and $(3, 8)$ _____

Word Problems

15. On a map, a school is at $(0, 0)$ and a library is at $(9, 12)$, in miles. How far apart are they?

_____

16. A drone flies in a straight vertical line from $(2, 1)$ to $(2, 9)$. How far did it travel?

_____

17. Two ships are at $(0, 0)$ and $(5, 12)$ on a grid measured in kilometers. Find the distance between them.

_____

18. A walking path runs straight from $(1, 2)$ to $(4, 6)$, measured in blocks. How long is the path?

_____

Answer Keys

1. $\boxed{5}$	**7.** $\boxed{5}$	**13.** $\boxed{10}$
2. $\boxed{10}$	**8.** $\boxed{\sqrt{2}}$	**14.** $\boxed{7}$
3. $\boxed{5}$	**9.** $\boxed{5}$	**15.** $\boxed{15 \text{ miles}}$
4. $\boxed{6}$	**10.** $\boxed{2\sqrt{2}}$	**16.** $\boxed{8 \text{ units}}$
5. $\boxed{6}$	**11.** $\boxed{3}$	**17.** $\boxed{13 \text{ km}}$
6. $\boxed{13}$	**12.** $\boxed{5}$	**18.** $\boxed{5 \text{ blocks}}$

Step-by-Step Explanations

1. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Use the distance formula: the legs are 3 and 4, so $d = \sqrt{3^2 + 4^2} = \sqrt{25} = 5$. So the final answer is 5.

2. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Legs 6 and 8: $d = \sqrt{36 + 64} = \sqrt{100} = 10$. So the final answer is 10.

3. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is The changes are 3 across and 4 up: $d = \sqrt{9 + 16} = 5$. So the final answer is 5.

4. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Same x, so the points are stacked vertically – just subtract: $9 - 3 = 6$. So the final answer is 6.

5. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Same y, so they sit on a horizontal line: $7 - 1 = 6$. So the final answer is 6.

6. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Legs 5 and 12: $d = \sqrt{25 + 144} = \sqrt{169} = 13$. So the final answer is 13.

7. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is The changes are 3 and 4: $d = \sqrt{9 + 16} = 5$. So the final answer is 5.

8. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Legs 1 and 1: $d = \sqrt{1 + 1} = \sqrt{2}$, already in simplest form. So the final answer is $\sqrt{2}$.

9. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Changes of 3 and 4 again: $d = \sqrt{9 + 16} = 5$. So the final answer is 5.

10. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Legs 2 and 2: $d = \sqrt{4 + 4} = \sqrt{8} = 2\sqrt{2}$. So the final answer is $2\sqrt{2}$.

11. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Same y, so just measure the horizontal gap: $4 - 1 = 3$. So the final answer is 3.

12. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Changes 3 and 4: $d = \sqrt{9 + 16} = 5$. So the final answer is 5.

13. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Legs 8 and 6: $d = \sqrt{64 + 36} = \sqrt{100} = 10$. So the final answer is 10.

14. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Same x, a vertical line: $8 - 1 = 7$. So the final answer is 7.

15. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is $d = \sqrt{9^2 + 12^2} = \sqrt{225} = 15$ miles. So the final answer is 15 miles.

16. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is A straight vertical flight has the same x, so the distance is $9 - 1 = 8$ units. So the final answer is 8 units.

17. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is $d = \sqrt{5^2 + 12^2} = \sqrt{169} = 13$ km. So the final answer is 13 km.

18. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is $d = \sqrt{3^2 + 4^2} = \sqrt{25} = 5$ blocks. So the final answer is 5 blocks.

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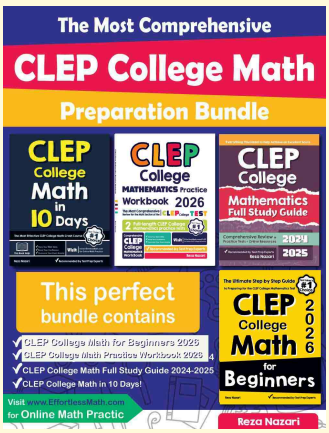

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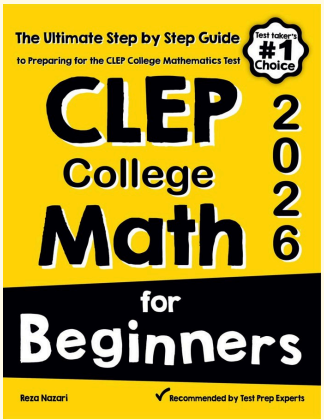

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