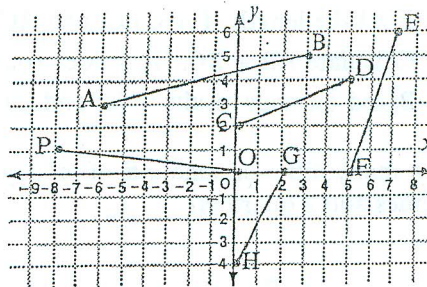


# Distance Between Two Points 10NRF

A Throughout the exercise, you may express your answers in radical form unless otherwise indicated.

- A line segment, AB, has endpoints A(1, 3) and B(2, 4).
  - Sketch a diagram to show this information.
  - Find the length of AB.
- A line segment, CD, has end points C(-3, 2) and D(2, -3).
  - Sketch a diagram to show this information.
  - Find the length of CD.
- Line segment, PQ, has end points P(-3, 4) and Q(2, 5).
  - Find the length PQ. Express your answer in radical form.
  - Express your answer in (a) to 1 decimal place.

- Refer to the diagram.  
Calculate the length of each line segment.



- Find the distance from the origin, O(0, 0), to each point. Leave your answer in radical form.

- |             |                           |                         |              |
|-------------|---------------------------|-------------------------|--------------|
| (a) (3, -2) | (b) (-5, 2)               | (c) (1, 6)              | (d) (-2, -9) |
| (e) (11, 2) | (f) $(-1\frac{1}{2}, -4)$ | (g) $(6, -\frac{1}{2})$ | (h) (-8, -6) |

- Find the distance between each pair of points.

- |                    |                      |                       |
|--------------------|----------------------|-----------------------|
| (a) (2, 2), (7, 4) | (b) (6, -6), (2, -3) | (c) (3, 8), (-3, -8)  |
| (d) (4, 4), (9, 9) | (e) (-3, 0), (8, -5) | (f) (9, -3), (12, -4) |

B Use a sketch of the information, if necessary, to help you solve the problem.

- The co-ordinates of points are shown.

- |          |          |           |           |
|----------|----------|-----------|-----------|
| A(10, 8) | B(14, 4) | C(6, 3)   | D(3, -3)  |
| E(1, -6) | F(-2, 0) | G(-3, -4) | H(-7, -8) |
| I(-8, 6) | J(-4, 2) | K(-3, 2)  | L(3, 5)   |

Which of the following have the same lengths?

- |        |        |        |        |        |        |
|--------|--------|--------|--------|--------|--------|
| (a) AB | (b) KL | (c) GH | (d) EF | (e) CD | (f) IJ |
|--------|--------|--------|--------|--------|--------|

- 8 A triangle has vertices  $A(2, 4)$ ,  $B(5, -5)$ , and  $C(-4, -2)$ . Find the lengths of the sides to determine what type of triangle  $\triangle ABC$  is.
- 9  $\triangle PQR$  has vertices  $P(5, 10)$ ,  $Q(8, 6)$  and  $R(-7, 1)$ . Find its perimeter.
- 10 Three vertices of a rectangle are  $S(2, 5)$ ,  $T(5, -1)$ , and  $U(-3, -5)$ .  
 (a) What are the co-ordinates of the missing vertex?  
 (b) Find the lengths of the sides. (c) What is the area of the rectangle?
- 11 Three islands are located by the following co-ordinates:  $F(-10, 4)$ ,  $Q(2, 8)$ ,  $R(7, -7)$ . Which island is closer to  $Q$ ?
- 12 Various ports on islands are shown by these co-ordinates.  
 $P(6, 6)$      $Q(-4, 4)$      $R(5, -5)$      $S(-3, 0)$      $T(11, 0)$      $U(-3, -9)$   
 How far did the ship travel if the ship visited the ports in the order given below?  
 (a)  $P, T, S$     (b)  $R, S, U$     (c)  $R, P, S$     (d)  $T, R, S$
- 13 Three vertices of a rectangle are  $P(-1, -10)$ ,  $Q(11, -6)$ , and  $S(-5, 2)$ .  
 (a) What are the co-ordinates of the missing vertex  $R$ ?  
 (b) Find the area of the rectangle.  
 (c) Name the co-ordinates of the midpoint of  $QR$ .  
 (d) Name the co-ordinates of the point at which the diagonals intersect.
- 14  $A(-4, 0)$ ,  $B(0, 1)$ , and  $C(4, 2)$  are points on the co-ordinate plane.  
 (a) Find the length of  $AB$ ,  $BC$ , and  $AC$ .  
 (b) Calculate  $AB + BC$ . How does your answer compare to your answers in (a)?  
 (c) Based on your results in (a) and (b), what conclusion can you make?
- 15 How many different amounts of money can you make from 2 pennies, 2 nickels, 2 dimes and 2 quarters?

**4.8 Exercise, page 165**  
 1. b)  $\sqrt{2}$  units 2. b)  $5\sqrt{2}$  units 3. a)  $\sqrt{26}$  units b) 5.1 units  
 4.  $AB = \sqrt{85}$  units,  $CD = \sqrt{29}$  units,  $EF = 2\sqrt{10}$  units,  
 $GH = 2\sqrt{5}$  units,  $OP = \sqrt{65}$  units 5. a)  $\sqrt{13}$  units  
 b)  $\sqrt{29}$  units c)  $\sqrt{37}$  units d)  $\sqrt{85}$  units e)  $5\sqrt{5}$  units  
 f)  $\frac{\sqrt{73}}{2}$  units g)  $\frac{\sqrt{145}}{2}$  units h) 10 units 6. a)  $\sqrt{29}$  units  
 b) 5 units c)  $2\sqrt{73}$  units d)  $5\sqrt{2}$  units e)  $\sqrt{146}$  units f)  $\sqrt{10}$  units  
 7.  $AB = GH = IJ$ ,  $KL = EF = CD$   
 8.  $AB = BC = 3\sqrt{10}$  units,  $AC = 6\sqrt{2}$  units; isosceles  
 9.  $(20 + 5\sqrt{10})$  units 10. a)  $V(-6, 1)$   
 b)  $ST = UV = 3\sqrt{5}$  units,  $TU = SV = 4\sqrt{5}$  units  
 c) 60 square units 11.  $F$  12. a)  $(\sqrt{61} + 14)$  units  
 b)  $(\sqrt{89} + 9)$  units c)  $(\sqrt{122} + \sqrt{117})$  units  
 d)  $(\sqrt{61} + \sqrt{89})$  units 13. a)  $R(7, 6)$  b) 160 square units  
 c)  $(9, 0)$  d)  $(3, -2)$  14. a)  $AB = BC = \sqrt{17}$  units,  
 $AC = 2\sqrt{17}$  units b)  $2\sqrt{17}$  units c)  $B$  midpoint of  $AC$  15. 50