

SECTION 6.1 - MIDPOINT + DISTANCE

* THE MIDPOINT OF A LINE SEGMENT IS A POINT THAT DIVIDES THE SEGMENT INTO EQUAL LENGTHS.

EXAMPLE. FIND THE MIDPOINT OF THE LINE SEGMENT WITH ENDPOINTS $(4, -7)$ AND $(-2, 3)$.

EXAMPLE. THE DIAMETER OF A CIRCLE HAS ENDPOINTS $(5, -11)$ AND $(-7, 6)$. WHAT ARE THE COORDINATES OF THE CENTER OF THE CIRCLE?

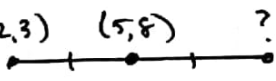
APPLICATION. FIND THE MIDPOINT OF EACH LINE SEGMENT WITH THE GIVEN ENDPOINTS.

(A) $(12, 7)$ AND $(-2, 11)$

(B) $(-8, -3)$ AND $(10, 9)$

EXAMPLE. THE MIDPOINT OF \overline{AB} IS $M(4, 3)$. IF THE COORDINATES OF A ARE $(17, -5)$, WHAT ARE THE COORDINATES OF B?

APPLICATION. FOR EACH OF THE FOLLOWING, FIND THE MISSING ENDPOINT.

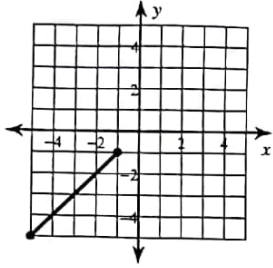
(A)  $(2, 3)$ $(5, 8)$?

(B) $A(-5, -7)$ $M(3, -11)$ $B(,)$

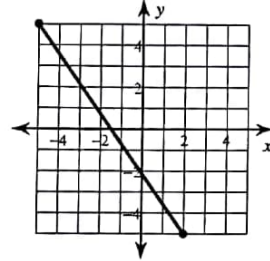
PRACTICE.

Find the midpoint of each line segment.

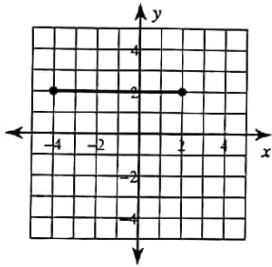
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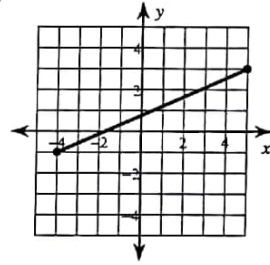
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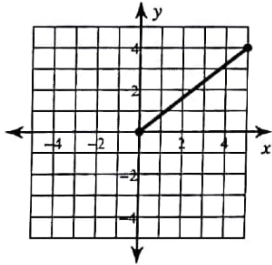
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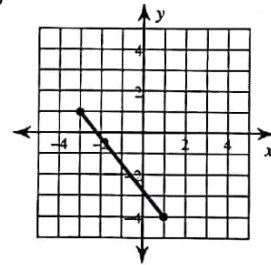
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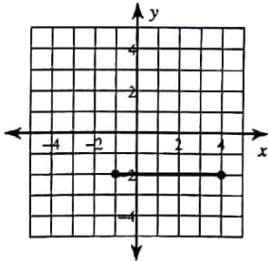
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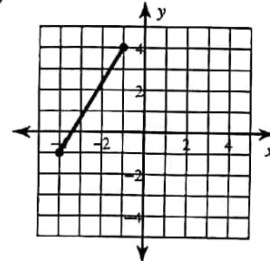
6)



7)



8)



Find the midpoint of the line segment with the given endpoints.

9) $(-4, 4), (5, -1)$

10) $(-1, -6), (-6, 5)$

11) $(2, 4), (1, -3)$

12) $(-4, 4), (-2, 2)$

13) $(5, 2), (-4, -3)$

14) $(-1, 1), (5, -5)$

15) $(2, -1), (-6, 0)$

16) $(-3.1, -2.8), (-4.92, -3.3)$

17) $(-5.1, -2), (1.4, 1.7)$

18) $(4.9, -1.3), (-5.2, -0.6)$

19) $(5.1, 5.71), (6, 3.6)$

20) $(3.1, -2.1), (-0.52, -0.6)$

Find the other endpoint of the line segment with the given endpoint and midpoint.

21) Endpoint: $(-1, 9)$, midpoint: $(-9, -10)$

22) Endpoint: $(2, 5)$, midpoint: $(5, 1)$

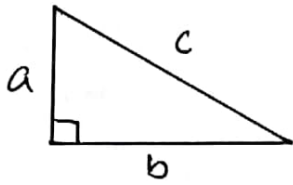
23) Endpoint: $(5, 2)$, midpoint: $(-10, -2)$

24) Endpoint: $(9, -10)$, midpoint: $(4, 8)$

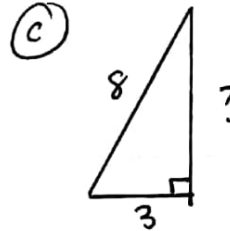
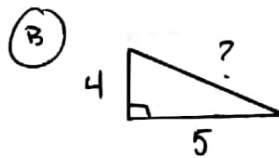
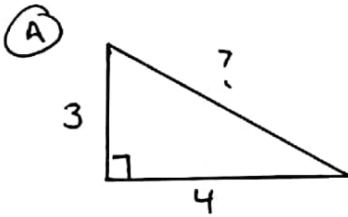
25) Endpoint: $(-9, 7)$, midpoint: $(10, -3)$

26) Endpoint: $(-6, 4)$, midpoint: $(4, 8)$

REVIEW OF THE PYTHAGOREAN THEOREM

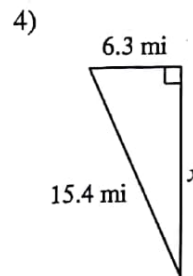
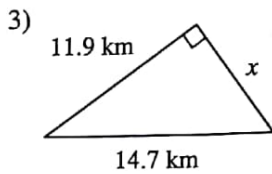
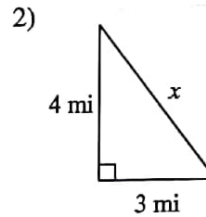
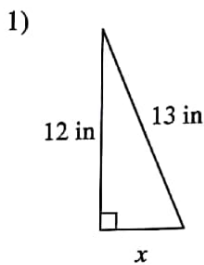


EXAMPLES. FIND THE MISSING SIDE.

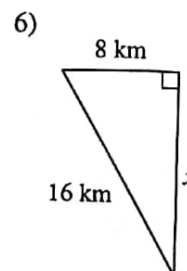
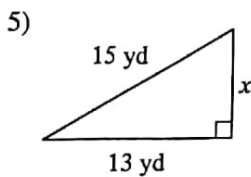


APPLICATIONS.

Find the missing side of each triangle. Round your answers to the nearest tenth if necessary.

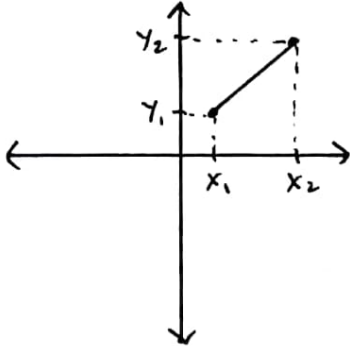


Find the missing side of each triangle. Leave your answers in simplest radical form.



THE DISTANCE FORMULA

THE DISTANCE BETWEEN ANY 2 POINTS (x_1, y_1) AND (x_2, y_2) CAN BE FOUND USING THE DISTANCE FORMULA. THE DISTANCE FORMULA IS DERIVED FROM THE PYTHAGOREAN FORMULA.

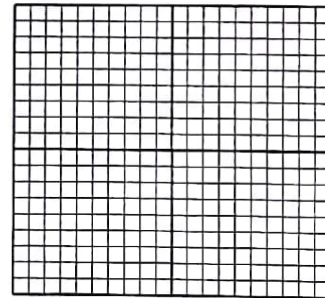
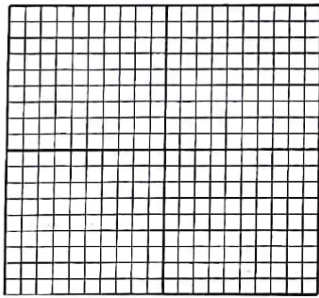


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EXAMPLES. FIND THE DISTANCE BETWEEN EACH PAIR OF POINTS.

(A) $(3, 7)$ AND $(-1, 4)$

(B) $(5, 2)$ AND $(3, 10)$



APPLICATION. FIND THE DISTANCE BETWEEN EACH PAIR OF POINTS.

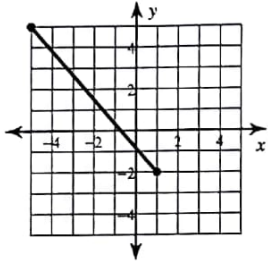
(1) $(5, 2)$ AND $(-2, -9)$

(2) $(5, 2)$ AND $(-2, 5)$

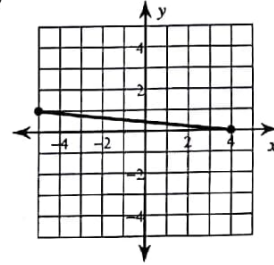
PRACTICE.

Find the distance between each pair of points.

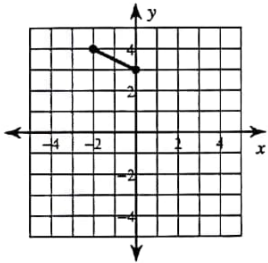
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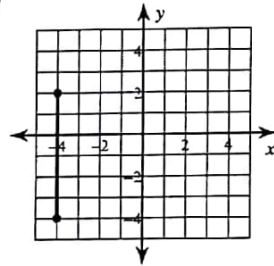
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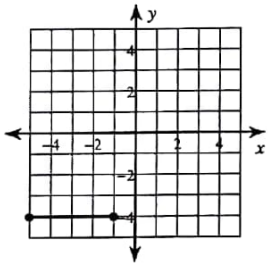
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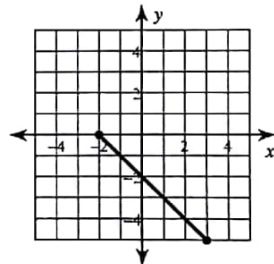
4)



5)



6)



7) $(-2, 3), (-7, -7)$

8) $(2, -9), (-1, 4)$

9) $(5, 9), (-7, -7)$

10) $(8, 5), (-1, 3)$

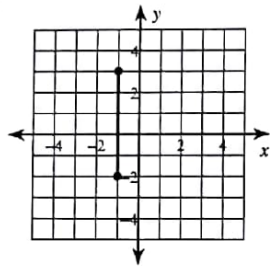
11) $(-10, -7), (-8, 1)$

12) $(-6, -10), (-2, -10)$

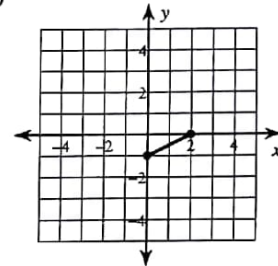
6

Find the distance between each pair of points.

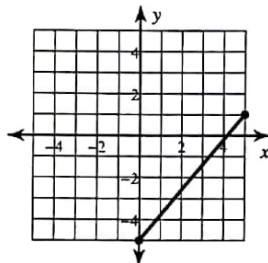
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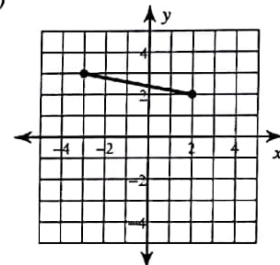
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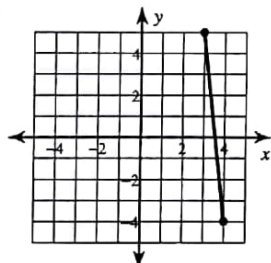
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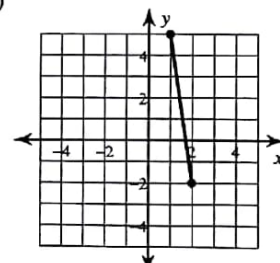
16)



17)



18)



19) $(0, -2), (-5, -1)$

20) $(6, 4), (-5, -1)$

21) $(3, 8), (9, 10)$

22) $(10, 1), (9, -4)$

23) $(-8, 10), (-6, 7)$

24) $(-5, 6), (8, -4)$