1) Reduce to simplest form: $\dfrac{a^5 b^3}{a^2 b^2}$

2) Reduce to simplest form: $\dfrac{a^3 b}{a \ b^2}$

3) Convert the repeating decimal into a fraction: $.03\overline{5}$

4) Convert the repeating decimal into a fraction: $.2\overline{7}$

5) Which is larger: **5^3 or 3^5? EXPLAIN**

6) **Approximate $\sqrt{60}$ Using PERFECT SQUARES**

7) **What is the length of the hypotenuse of a an Isosceles right triangle with a side of 1 foot?**

$$a^2 + b^2 = c^2$$

$$c = \sqrt{a^2 + b^2}$$

$$a = \sqrt{c^2 - b^2}$$
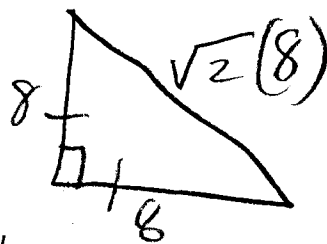
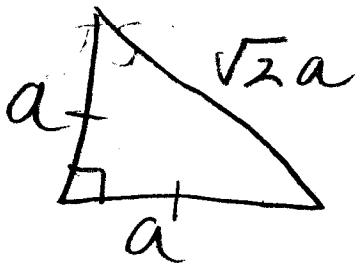$$b = \sqrt{c^2 - a^2}$$

TRIPLET Ratio

3 - 4 - 5
6 - 8 - 10
ect
12, 5, 13

legs shorter
c Longest opposite ⦜

Isosceles
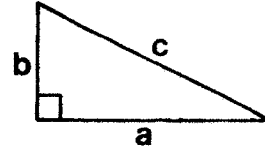Right

dist $\sqrt{(x_1 \pm x_2)^2 + (y_1 \pm y_2)^2}$ dist

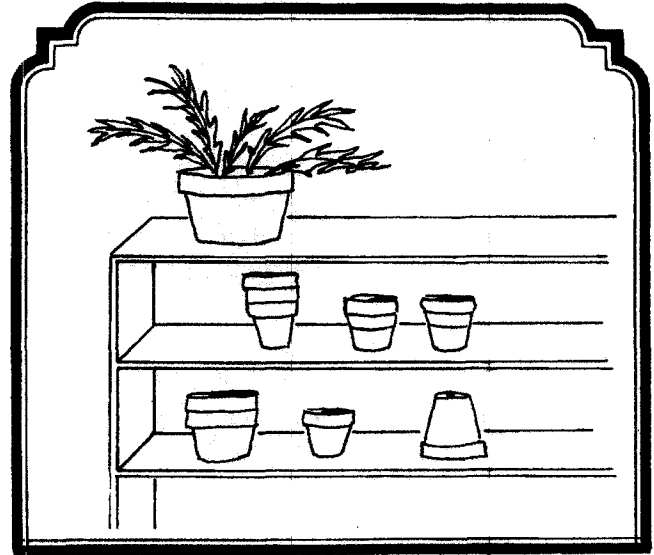mid $\dfrac{(x_1 + x_2)}{2}$ $\dfrac{(y_1 + y_2)}{2}$

What Is the Title of This Picture?

For each exercise below, find the missing length. (Refer to the diagram at the right.) Find your answer in the answer column and notice the letter next to it. Each time the exercise number appears in the code, write this letter above it. Keep working and you will decode the title of the picture.

① $a = 8$, $b = 6$, $c =$ _____

② $a = 4$, $b = 9$, $c =$ _____

③ $a = 12$, $b = 12$, $c =$ _____

④ $a = 7$, $b = \sqrt{20}$, $c =$ _____

⑤ $a = \sqrt{175}$, $b = 15$, $c =$ _____

⑥ $a =$ _____, $b = 5$, $c = 10$

⑦ $a = 12$, $b =$ _____, $c = 13$

⑧ $a =$ _____, $b = \sqrt{56}$, $c = 14$

⑨ $a = 1.5$, $b =$ _____, $c = 2.5$

⑩ $a = \sqrt{85}$, $b = \sqrt{59}$, $c =$ _____

⑪ $a =$ _____, $b = 6$, $c = \sqrt{70}$

⑫ $a = 40$, $b =$ _____, $c = 41$

⑬ $a = 1$, $b = 1$, $c =$ _____

⑭ $a =$ _____, $b = \sqrt{2}$, $c = \sqrt{3}$

CODED TITLE:

$\overline{11}$ $\overline{14}$ $\overline{5}$ $\overline{10}$ $\overline{8}$ $\overline{5}$ $\overline{11}$ $\overline{4}$ $\overline{13}$ $\overline{2}$ $\overline{14}$ $\overline{6}$

$\overline{14}$ $\overline{13}$ $\overline{1}$ $\overline{14}$ $\overline{12}$ $\overline{3}$ $\overline{2}$ $\overline{13}$ $\overline{7}$ $\overline{9}$ $\overline{11}$ $\overline{5}$

Ⓔ $\sqrt{400} = 20$　　　Ⓟ $\sqrt{81} = 9$　　　Ⓝ $\sqrt{25} = 5$

Ⓡ $\sqrt{67} \doteq 8.19$　　Ⓖ $\sqrt{100} = 10$　　Ⓘ $\sqrt{2} \doteq 1.41$

Ⓢ $\sqrt{34} \doteq 5.83$　　Ⓞ $\sqrt{288} \doteq 16.97$　Ⓦ $\sqrt{69} \doteq 8.31$

Ⓣ $\sqrt{97} \doteq 9.85$　　Ⓛ $\sqrt{144} = 12$　　Ⓤ $\sqrt{4} = 2$

Ⓥ $\sqrt{140} \doteq 11.83$　Ⓗ $\sqrt{1} = 1$　　　Ⓐ $\sqrt{75} \doteq 8.66$

OBJECTIVE 3–e: To find the length of a side of a right triangle using the Pythagorean property.

How Do You Write a Song That Will Knock Over a Cow?
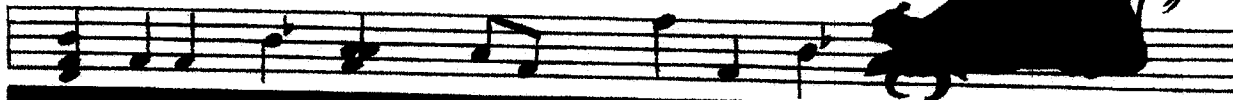
Solve each problem below. Cross out the box that contains your answer. When you finish, print the letters from the remaining boxes in the spaces at the bottom of the page.

(1) For each right triangle, find the length of the side that is not given:

A — 6 m, 11 m

B — 8 m, 13 m

C — 2 m, $\sqrt{3}$ m
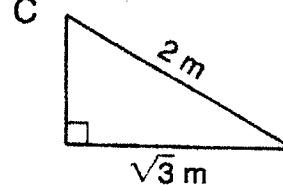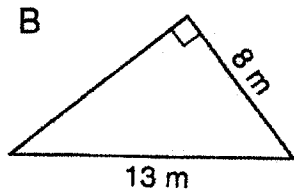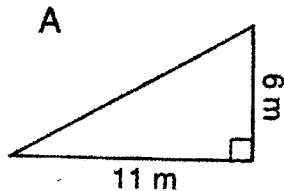
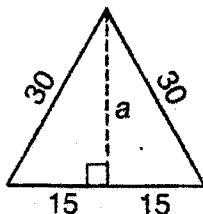**(2)** A rectangle is 7 cm wide and 10 cm long. Find the length of a diagonal of the rectangle.

(3) Each side of an equilateral triangle measures 30 cm. Find the length of an altitude, a, of the triangle.
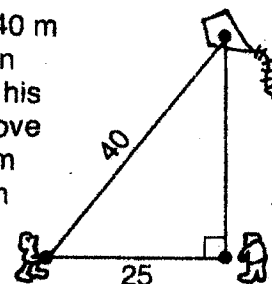
30, 30, a, 15, 15

(4) A television set may be described in terms of the diagonal measure of its screen. If a TV screen is 16 inches by 12 inches, what is the length of its diagonal?

(5) A 20-foot ladder is leaned against a wall. If the base of the ladder is 8 feet from the wall, how high up on the wall will the ladder reach?

(6) The bases of a softball diamond are 60 feet apart. How far is it from home plate to second base?

(7) Jack has let out 40 m of kite string when he observes that his kite is directly above Jill. If Jack is 25 m from Jill, how high is the kite?

40, 25

BY	IN	SO	TH	BE	AT	ER
$\sqrt{7200}$ ft	$\sqrt{123}$ m	$\sqrt{105}$ m	$\sqrt{675}$ cm	$\sqrt{6400}$ ft	$\sqrt{975}$ m	$\sqrt{149}$ cm
$\doteq$84.9 ft	$\doteq$11.1 m	$\doteq$10.2 m	$\doteq$26.0 cm	=80 ft	$\doteq$31.2 m	$\doteq$12.2 cm

EF	OR	NG	FL	IT	BE	AT
$\sqrt{850}$ m	$\sqrt{336}$ ft	$\sqrt{157}$ m	$\sqrt{425}$ cm	$\sqrt{1}$ m	$\sqrt{400}$ in.	$\sqrt{380}$ in.
$\doteq$29.2 m	$\doteq$18.3 ft	$\doteq$12.5 m	$\doteq$20.6 cm	=1 m	=20 in.	$\doteq$19.5 in.

OBJECTIVE 3–f: To solve word problems using the Pythagorean property.

Did You Hear About . . .

1	2	3	4	5	6	7
8	9	10	11	12	13	14 ?

Write the word next to each correct answer in the box that contains the exercise number (some answers are rounded).

Find the missing side length, if possible.

1

6 cm, 11 cm

2

14 ft, 14 ft

3

9 in., 16 in.

4

12 yd, 13 yd

5

25 cm, 38 cm

6

0.8 mi, 0.5 mi

7

15 ft, 25 ft

8

40 in., 40 in.

9

100 m, 70 m
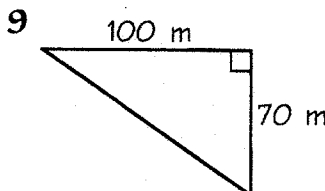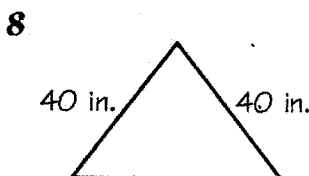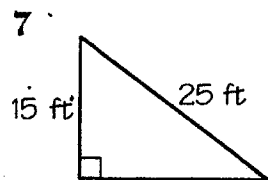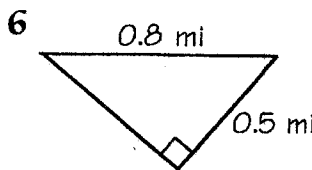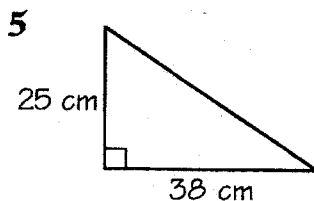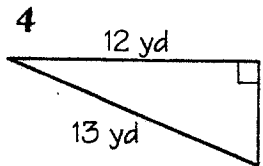
Solve.

10 Mr. Smog just bought a big-screen TV set. The screen is 48 in. wide and 27 in. high. Find the length of its diagonal.
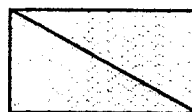
11 An 18-foot ladder is leaned against a wall. If the base of the ladder is 7 feet from the wall, how high up on the wall does the ladder reach?

12 Hulk left home and walked 8 blocks west. Then he turned and walked 6 blocks north. If each block is 500 ft long, how far is Hulk from home?
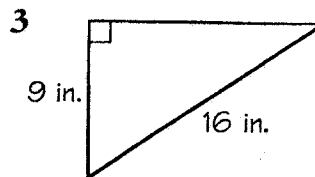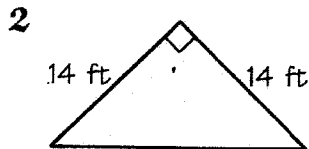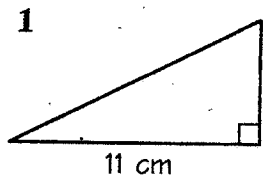
13 Each side of an equilateral triangle measures 9 cm. Find the height, h, of the triangle.

h, 9 cm
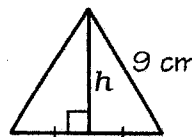
14 The lawn in front of Kermit Middle School is in the shape of a rectangle 30 yd long and 16 yd wide How much shorter is your walk if you walk diagonally across the lawn rather than along two sides of it?

12.9 in. • BOOK
0.6 mi • AROUND
55.1 in. • BY
12 yd • ROUTE
0.7 mi • FROM
6000 ft • BIGGER
5 yd • WHO
12.5 cm • THE
5000 ft • A
44.9 cm • TRIED
20 ft • A
17.2 ft • PUTTING
13.2 in. • STUDENT
122.1 m • BLOCK
56.5 in. • BECAUSE
45.5 cm • WALKED
16.6 ft • TAKING
8.3 cm • NUMBER
19.8 ft • MATH
7 yd • FIGURE
7.8 cm • SQUARE
121.5 m • COUNTING
not possible • CITY

Name _____

Use the list below to complete the sentences. Use each term once.

Converse of the Pythagorean Theorem	Pythagorean Theorem	leg
hypotenuse	$a^2 + b^2 = c^2$	

1. A shorter side of a right triangle is a _____ .

2. The mathematical equation used in the Pythagorean Theorem and its converse is _____ .

3. The _____ states that if a triangle is a right triangle, then the sum of the squares of the lengths of the two shorter sides is equal to the square of the length of the longest side.

4. The _____ states that if the sum of the squares of the lengths of the two shorter sides of a triangle is equal to the square of the length of the longest side, then the triangle is a right triangle.

5. The longest side of a right triangle is the _____ .

Label the parts of the triangle with their names. Then complete the equation using the appropriate terms.

_____ + _____ = _____
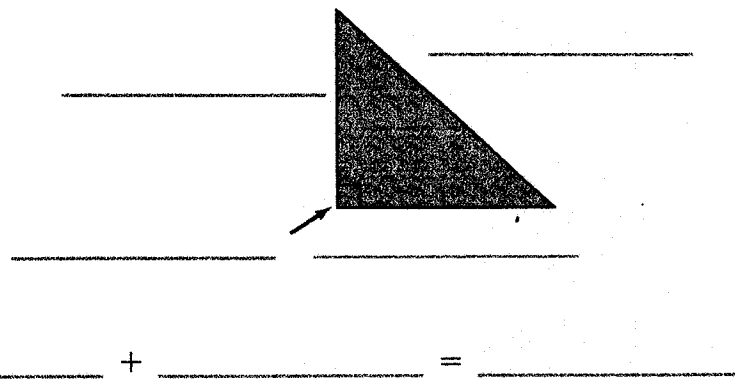
Mid Point | Distance

$$\frac{X_2 + X_1}{2}, \frac{Y_2 + Y_1}{2} \Bigg| \sqrt{(X_2 - X_1)^2 + (Y_2 - Y_1)^2}$$
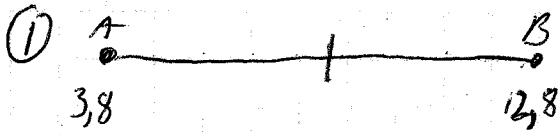
① A ———|——— B $12 + 3 = \frac{15}{2} = 7.5$
  3,8   12,8
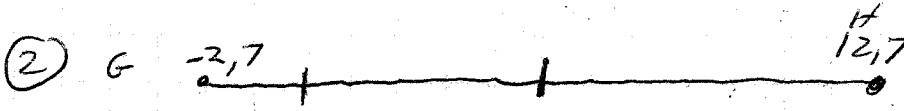
② G   -2,7 —|——|——— H   12,7
                          distance
                          by
                    point
                    $12 + -2 = \frac{10}{2} = 5$

③ 2,6
  C

  2,5
  D

④   F 6,5

      E
      3,1

⑤ I 2,6

            J
            10,0

⑥ L
  4,15

                M
                9,10

  4,+5
  A
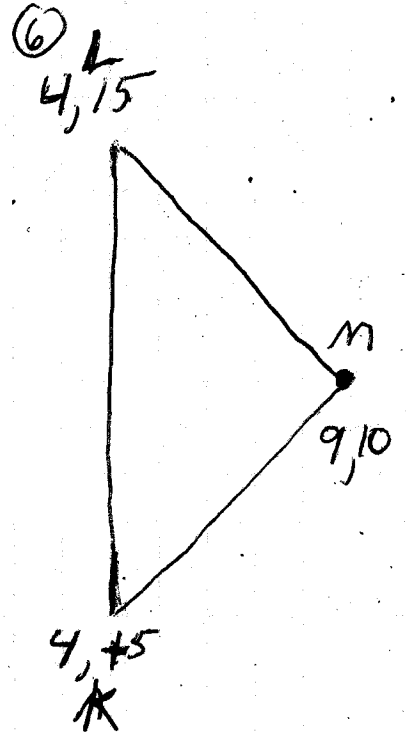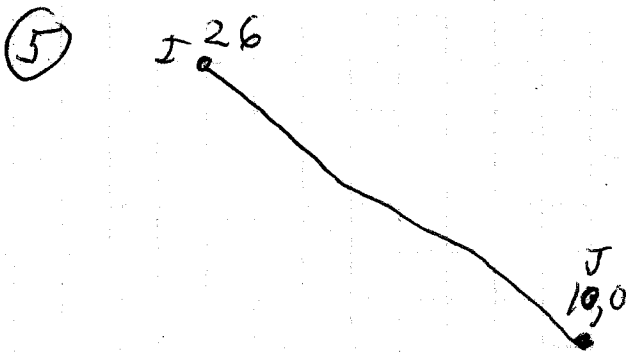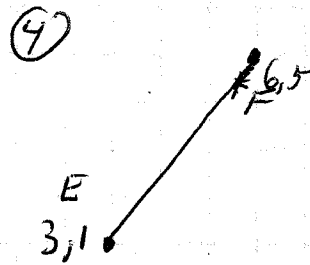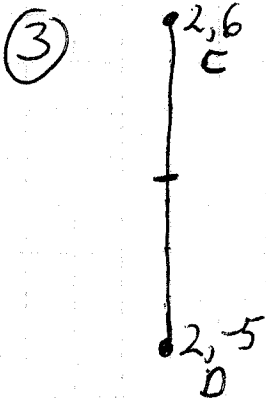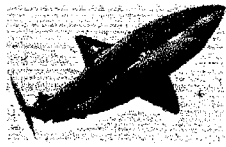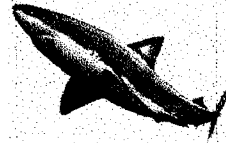
Part A: The Midpoint Formula

1. Plot and label the following points on the grid provided.

   a. **Stranded man** **(-3, 2)**   d. **Empty boat (0, -4)**

   b. **Life jacket** **(-2, -4)**   e. **Hungry shark (2, -2)**

   c. **USS Coast Guard boat (4, 5)**   f. **Oil Rig (3, 0)**

2. What is the midpoint between the oil rig and the life jacket?

3. A cup is floating midway between the stranded man and the empty boat. What is the point of this location?

4. The Coast Guard boat is midway between the stranded man and the Coast Guard Headquarters. What are the coordinates of the coast guard headquarters?
(**Hint:** Headquarters may not fit on the grid).

(?,?)

(4, 5)

HELP!

(-3, 2)

Shark Attack!
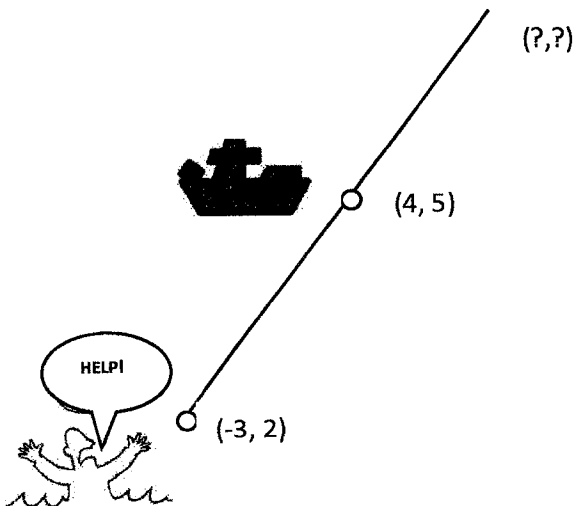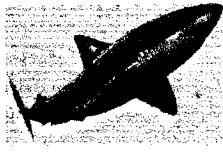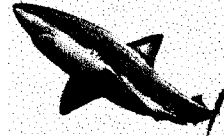
Part A: The Midpoint Formula (x, y) $\left(\dfrac{x_1 + x_2}{2}\right), \left(\dfrac{y_1 + y_2}{2}\right)$

1. Plot and label the following points on the grid provided.

    a. **Stranded man** (-3, 2)
    b. **Life jacket**   (-2, -4)
    c. **USS Coast Guard boat** (4, 5)

    d. **Empty boat** (0, -4)
    e. **Hungry shark** (2, -2)
    f.   **Oil Rig** (3, 0)
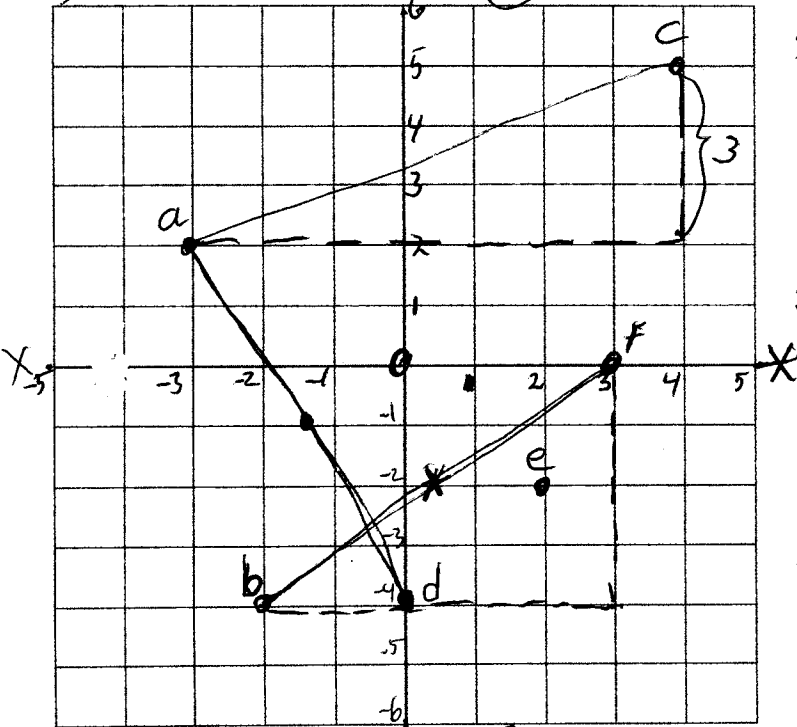
2. What is the midpoint between the oil rig and the life jacket? visual or mathematical

$\dfrac{(x_1 + x_2)}{2}$ $\dfrac{(y_1 + y_2)}{2}$

$\left(\dfrac{1}{2}\right)$ $\dfrac{-4 - (-2)}{2}$

3, 0 Oil
-2 -4 Jacket
1   -4

3. A cup is floating midway between the stranded man and the empty boat. What is the point of this location? visual or mathem

(a) man   -3   2
(d) Boat   0   -4
       -3   -2

$\dfrac{-3}{2}$ $\dfrac{-2}{2}$

$\left(-1\tfrac{1}{2}\right) \left(-1\right)$

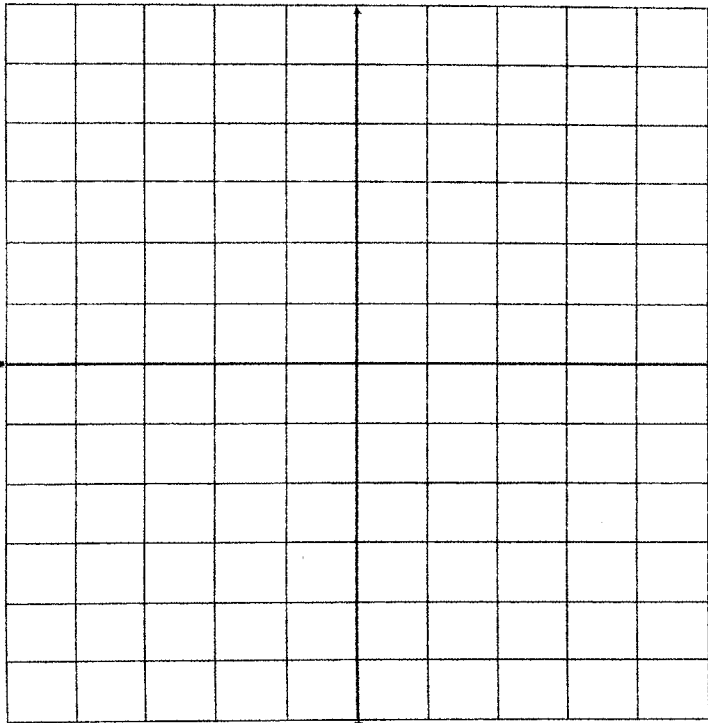4. The Coast Guard boat is midway between the stranded man and the Coast Guard Headquarters. What are the coordinates of the coast guard headquarters?
(**Hint:** Headquarters may not fit on the grid).

$\dfrac{-3 + x}{2} = 4$

$\dfrac{2 + y}{2} = 5$

$-3 + x = 8$
$\quad +3 \quad +3$
$\qquad x = 11$ visual or mathematical

$2 + y = 10$
-2
$\quad y = 8$

(?,?)
11, 8
3
7
(4, 5)
3
7
(-3, 2)

HELP!

Maps with Distance and Midpoint

Name: _____

Directions: You must use a piece of graph paper when creating this map.
All work must be shown on a separate sheet of paper.
Begin by drawing and labeling your x and y axes on your graph paper. (you need +/- 10 Units)
Make sure that your axes cover the entire area of the page.

Restaurants:	**Buildings:**	**Stores:**
Burger King (-2, 3)	City Hall (-9, -8)	Wal-Mart (4, -4)
Hardee's (4, 1)	Post Office (-3, 8)	Target (-8, 6)
McDonald's	Courthouse	Food Lion
Chick-Fil-A	Library	Lowe's
Bojangles	Armory	BP Station (1, -10)

1. Plot and label the locations given on your map. Label the quadrants with signs as an aid

2. Bojangles is located at the midpoint of Burger King and Hardee's. Plot and label Bojangles on the map and write the coordinates of Bojangles here _____.

3. The Library is located at the midpoint of City Hall and the Post Office. Plot and label the Library on the map and write the coordinates of the Library here _____.

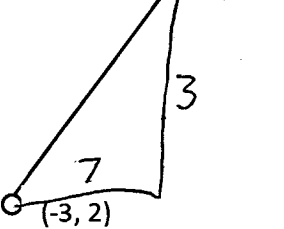4. Food Lion is located at the midpoint of Wal-Mart and Target. Plot and label Food Lion on the map and write the coordinates of Food Lion here _____.

5. Hardee's is the midpoint between Burger King and Chick-Fil-A. Plot and label Chick-Fil-A on the map and write the coordinates of Chick-Fil-A here _____. (Work it backward! (-2 + x)/2= 4)

6. The courthouse is the midpoint between the post office and the Library. Plot and label the Courthouse on the map and write the coordinates of the Courthouse here _____.

7. Wal-Mart is the midpoint between Lowe's and the BP station. Plot and label the Lowe's on the map and write the coordinates of Lowe's here _____.

8. Burger King is the midpoint between Target and the Armory. Plot and label the Armory on the map and write the coordinates of the Armory here _____.

9. (-2, -2) is the midpoint between McDonald's and City Hall. Plot and label McDonald's on the map and write the coordinates of McDonald's here _____.

10. Use your map and coordinates to find the distances between the following points of interest: Show work!

11. What is the distance between McDonald's and the BP station? _____

12. What is the distance between Wal-Mart and Hardee's? _____

13. What is the distance between Target and City Hall? _____

14. What is the distance between the Armory and the Library? _____

15. What is the distance between Chick-Fil-A and Food Lion? _____

16. What is the distance between Lowe's and Burger King? _____

17. What is the distance between the courthouse and Bojangles? _____

18. What is the distance between McDonald's and the Chick-Fil-A? _____

19. What is the distance between Wal-Mart and the BP station? _____

20. What is the distance between the Post Office and Target? _____

Maps with Distance and Midpoint

Name: _____

Directions: You must use a piece of graph paper when creating this map. All work must be shown on a separate sheet of paper. Begin by drawing and labeling your x and y axes on your graph paper. Make sure that your axes cover the entire area of the page.

Restaurants:	**Buildings:**	**Stores:**
Burger King located at (-2, 3)	City Hall located at (-9, -8)	Wal-Mart located at (4, -4)
Hardee's located at (4, 1)	Post Office located at (-3, 8)	Target located at (-8, 6)
McDonald's	Courthouse	Food Lion
Chick-Fil-A	Library	Lowe's
Bojangles	Armory	BP station located at (1, -10)

1. Plot and label the locations given on your map.

2. Bojangles is located at the midpoint of Burger King and Hardee's. Plot and label Bojangles on the map and write the coordinates of Bo jangles' here ___*1, 2*___.

3. The library is located at the midpoint of City Hall and the post office. Plot and label the Library on the map and write the coordinates of the Library here ___*-6, 0*___.

4. Food Lion is located at the midpoint of Wal-Mart and Target. Plot and label Food Lion on the map and write the coordinates of Food Lion here ___*-2, 1*___.

5. Hardee's is the midpoint between Burger King and Chick-Fil-A. Plot and label Chick-Fil-A on the map and write the coordinates of Chick-Fil-A here ___*(0, -1)*___. $\frac{-2+x}{2} = 4$ $\frac{3+y}{2} = 1$
   $-2+x=8 \quad x=10$ $3+y=2$ $y=-1$

6. The courthouse is the midpoint between the post office and the Library. Plot and label the Courthouse on the map and write the coordinates of the Courthouse here ___*-4.5, 4*___.   *Stop* $y=$

7. Wal-Mart is the midpoint between Lowe's and the BP station. Plot and label the Lowe's on the map and write the coordinates of Lowe's here ___*7, 2*___.   *Stop*

8. Burger King is the midpoint between Target and the Armory. Plot and label the Armory on the map and write the coordinates of the Armory here ___*4, 0*___.

9. (-2, -2) is the midpoint between McDonald's and City Hall. Plot and label McDonald's on the map and write the coordinates of McDonald's here ___ $\frac{-9+x}{2}=-2 \quad \frac{-8+y}{2}=-2$ $-9+x=-4$ $-8+y=-4$ $y=4$ $(5, 4)$

10. Use your map and your coordinates to find the distances between the following points of interest:

11. What is the distance between McDonald's and the BP station? _____

12. What is the distance between Wal-Mart and Hardee's? _____

13. What is the distance between Target and City Hall? _____

14. What is the distance between the Armory and the Library? _____

15. What is the distance between Chick-Fil-A and Food Lion? _____

16. What is the distance between Lowe's and Burger King? _____

17. What is the distance between the courthouse and Bojangles? _____

18. What is the distance between McDonald's and the Chick-Fil-A? _____

19. What is the distance between Wal-Mart and the BP station? _____

20. What is the distance between the Post Office and Target? _____

−+

++

Y

12
11
10
9
8
7
6
5
4
3
2

Target
o

BK   3
        (BJ)   2
                H #2 Visual

X

−12 −11 −10 −9 −8 −7 −6 −5 −4 −3 −2 −1   1 2 3 4 5 6 7 8 9 10 11 12

−1
−2
−3
−4
−5
−6
−7
−8
−9
−10
−11
−12

− −

+ −

            X,Y
BK (−2,3)   Target (−8,6)

Hard (4,1)

#2 Algebra
#2
BOJO

                X   Y
BK   −2   3

Har   4   1
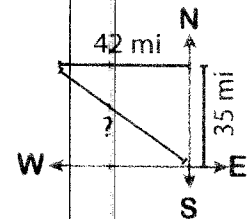
BJ $\frac{-2+4}{2}$ $\frac{3+1}{2}$

        $\frac{2}{2}$ (1) $\frac{4}{2}$ (2)

Pythagorean Theorem

Solve the word problems. Round the answer to the nearest tenth.

1) Mark is on his way home from work. He drives 35 miles due North and then 42 miles due West. Find the shortest distance he can cover to reach home early.

   54.7 miles

2) Mr. Richard owns an orchard that has a rectangular fence. The orchard is 36 yards long and 18 yards wide. If he walks across the diagonal length of the orchard, how much distance would he cover?

   40.2 yards

3) Joey made a sandwich that was 2 inches long and 4 inches high. If he cuts the sandwich in half as shown in the figure, what would be the diagonal length of the sandwich?
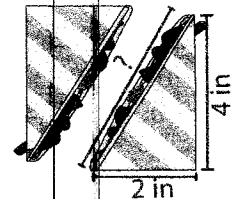
   4.5 inches

4) A 15 feet tree casts a shadow that is 8 feet long. What is the distance from the tip of the tree to the tip of its shadow?
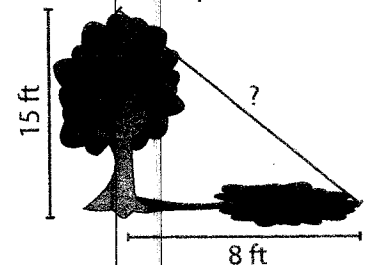
   17 feet

5) Rachel bought a rug for her apartment. The rug is 11 feet long and 9 feet wide. Find the diagonal length of the rug.
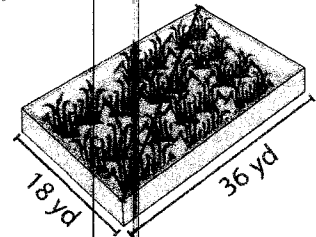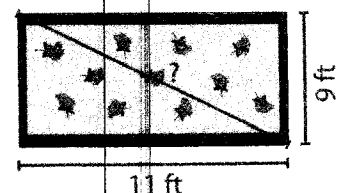
   14.2 feet

Pythagorean Theorem
Level 1: S1

Solve the word problems. Round the answer to the nearest tenth.

1) Mark is on his way home from work. He drives 35 miles due North and then 42 miles due West. Find the shortest distance he can cover to reach home early.

$$a^2 + b^2 = c^2$$
$$\sqrt{a^2 + b^2} = c$$
$$\sqrt{35^2 + 42^2}$$
$$\sqrt{1225 + 1764} \quad \sqrt{2989}$$

$$\sim 54.7 \text{ miles}$$

Reduce
6.

X 7

36 +25
61
788
X 7

2) Mr. Richard owns an orchard that has a rectangular fence. The orchard is 36 yards long and 18 yards wide. If he walks across the diagonal length of the orchard, how much distance would he cover?

$$\sqrt{a^2 + b^2} = c$$
$$\sqrt{18^2 + 36^2}$$
$$\sqrt{324 + 1296}$$
$$\sqrt{1620}$$

$$\sim 40.2$$

Reduce B + 6

3
6

18 yd   36 yd

$$\sqrt{3^2 + 6^2}$$
$$\sqrt{9 + 36}$$
$$\sqrt{45}$$
6.7
X 6
40.2

3) Joey made a sandwich that was 2 inches long and 4 inches high. If he cuts the sandwich in half as shown in the figure, what would be the diagonal length of the sandwich?
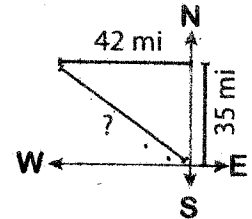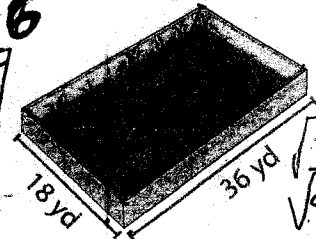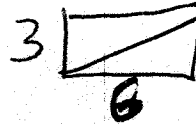
$$\sqrt{a^2 + b^2} = c$$
$$\sqrt{2^2 + 4^2}$$
$$\sqrt{4 + 16}$$
$$\sqrt{20} = 4.47$$

$$\sim 4.5$$

$$\sqrt{2} \sim 1.41$$
$$\sqrt{10} \sim 3.16$$
$$4.455$$
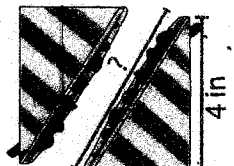
16   20
25   $\sim 4\frac{4}{9}$ = 4.44

4 in   2 in

4) A 15 feet tree casts a shadow that is 8 feet long. What is the distance from the tip of the tree to the tip of its shadow?

$$c = \sqrt{a^2 + b^2}$$
$$\sqrt{15^2 + 8^2}$$
$$\sqrt{225 + 64}$$
$$\sqrt{289}$$
$$c = 17$$

$$17$$

15 ft   ?   8 ft

5) Rachel bought a rug for her apartment. The rug is 11 feet long and 9 feet wide. Find the diagonal length of the rug.

$$c = \sqrt{a^2 + b^2}$$
$$c = \sqrt{11^2 + 9^2}$$
$$\sqrt{121 + 81}$$
$$\sqrt{202} \sim \sqrt{200}$$
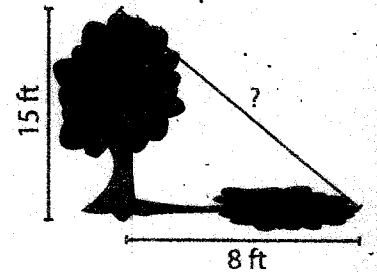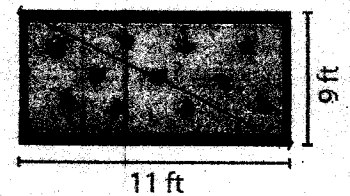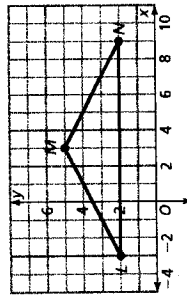
$$14.2$$

9 ft   11 ft

$$\sqrt{2} \sqrt{10}$$

Name _____

1. The Pythagorean Theorem is a relationship between the lengths of the sides of what kind of triangle?

Ⓐ Acute

Ⓑ Equilateral

Ⓒ Isosceles

Ⓓ Right

2. A triangular piece of fabric has side lengths of 1.2 feet, 2 feet, and 1.6 feet. Will it fit in the corner of a rectangular quilt? Explain.

3. Seraphina says that $\triangle KLM$ is a right triangle. Is she correct? Explain.
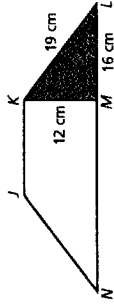
4. Town Hall is located 4.3 miles directly east of the middle school. The fire station is located 1.7 miles directly north of Town Hall.

Part A

What is the length of a straight line between the school and the fire station? Round to the nearest tenth.

Part B

The hospital is 3.1 miles west of the fire station. What is the length of a straight line between the school and the hospital? Round to the nearest tenth.

5. What is the length of the diagonal of a poster board with dimensions 22 inches by 28 inches? Round to the nearest tenth.

Ⓐ 24.8 in.

Ⓑ 28.4 in.

Ⓒ 35.6 in.

Ⓓ 50 in.

6. The three side lengths of a triangle are given. Which triangle is a right triangle?

Ⓐ Triangle 1: $\sqrt{13}$, 6, 7

Ⓑ Triangle 2: 7, 8, 13

Ⓒ Triangle 3: 10, 11, 12

Ⓓ Triangle 4: $\sqrt{10}$, 9, 8

7. Lana draws $\triangle LMN$ on the coordinate plane.

What is the perimeter of $\triangle LMN$? Round to the nearest unit.

8. Three side lengths of a right triangle are given. Does it matter where you substitute the lengths in the Pythagorean Theorem? Explain.

9. The top of a ladder rests at a height of 15 feet against the side of a house. If the base of the ladder is 6 feet from the house, what is the length of the ladder? Round to the nearest foot.

Ⓐ 9 ft

Ⓑ 14 ft

Ⓒ 16 ft

Ⓓ 21 ft

10. Kylie needs to pack her baton for a color-guard competition. The baton is 38 inches long. She has a rectangular box with a base of 13 inches by 35 inches and a height of 13 inches.

Part A

Could the baton lie flat on a diagonal along the base of the box? Explain.

Part B

Could the baton fit along the interior diagonal of the box? Explain.

11. Vanessa draws one side of equilateral $\triangle ABC$ on the coordinate plane at points $A(-2, 1)$ and $B(4,1)$. What are the two possible coordinates of vertex C? Round to the nearest tenth.

Name _____

1. The equation $y = 7.6x$ represents a proportional relationship. What is the constant of proportionality?

Ⓐ $\frac{1}{7.6}$

Ⓑ 7.6

Ⓒ x

Ⓓ y

2. The tables show the numbers of green and purple beads Mia and Riley used to make 5 different decorative picture frames.

Mia's Picture Frames

Green	2	4	6	8	10
Purple	7	14	21	28	35

Riley's Picture Frames

Green	5	10	15	20	25
Purple	8	13	18	23	28

Part A
Are the numbers of green and purple beads in Mia's picture frames proportional? Write an equation that relates the number of purple beads, p, to the number of green beads, g.

Part B
Are the numbers of green and purple beads in Riley's picture frames proportional? Write an equation that relates the number of purple beads, p, to the number of green beads, g.

3. The graph shows how many sheets of paper a paper-folding machine can fold in a certain number of minutes.
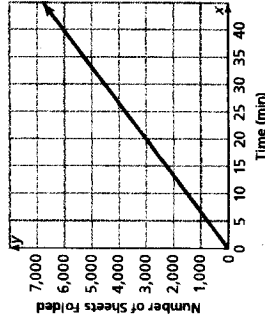
Part A
What is the constant of proportionality, and what does it mean in this situation?

Part B
Choose one ordered pair on the graph. What does it represent in this situation?

4. Janet hiked $\frac{3}{8}$ mile in $\frac{1}{4}$ hour. How fast did she hike, in miles per hour?

Ⓐ $\frac{3}{32}$ mile per hour

Ⓑ $\frac{2}{3}$ mile per hour

Ⓒ $1\frac{1}{2}$ miles per hour

Ⓓ 4 miles per hour

---

5. Rachel used 4.5 cups of apple juice in a holiday fruit punch that serves 12 people. Art used 4.75 cups of apple juice in a holiday fruit punch that serves 10 people. How much more apple juice is in one serving of Art's holiday fruit punch?

Ⓐ 0.05 cup

Ⓑ 0.1 cup

Ⓒ 0.375 cup

Ⓓ 0.475 cup

6. The water pump for a swimming pool can move 166.5 gallons of water in 3 minutes. The number of gallons, g, is proportional to the number of minutes, m, that the pump operates. Which of the following equations represents the relationship between g and m? Select all that apply.
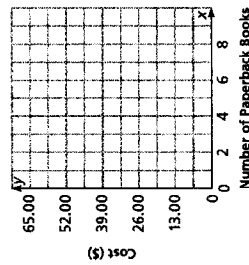
☐ $m = \frac{1}{55.5}g$

☐ $g = 55.5m$

☐ $g = 0.02m$

☐ $g = \frac{166.5}{3}m$

☐ $m = 55.5g$

7. A grocery store manager uses $\frac{1}{2}$ crate of apples for every $\frac{3}{4}$ crate of oranges in a fruit display. How many crates of oranges will she need if she uses $2\frac{1}{2}$ crates of apples?

8. At the local bookstore, Jim bought 2 paperback books for $13.00. Maria bought 5 paperback books for $32.50. Tanya bought 7 paperback books for $45.50.

Part A
Use a graph to represent the situation.

Part B
Do the number of books and the cost have a proportional relationship? Explain.

Part C
What does the point (1, 6.50) represent in this situation? What does the point (0, 0) represent?

Name _____ **Key**

1. For **a–d**, choose Yes or No to tell whether each of the following sets of side lengths will make a shelf that fits in a 90° corner of a room.
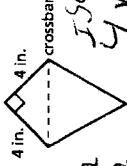
   a. 6 cm, 8 cm, 10 cm   ● Yes   ○ No
   b. 2 cm, 3 cm, 4 cm   ○ Yes   ● No
   c. 5 cm, 6 cm, 9 cm   ○ Yes   ● No
   d. 3 cm, 4 cm, 5 cm   ● Yes   ○ No

   $36 + 64 = 100$
   $6^2 + 8^2 = 10^2$
   $3 - 4 - 5$
   $2^2 + 3^2 \ne 4^2 \quad 4 + 9 \ne 16 \quad 13 \ne 16$
   $5^2 + 6^2 \ne 9^2 \quad 25 + 36 = ? \quad 61 \ne 81$
   $a^2 + b^2 = c^2$ "c is always long"

2. Why is the diagonal of any rectangular prism always longer than any one side? Explain.

 c a^2

3. Sasha ordered a kite online. When it arrived, the kite was missing the crossbar. What length crossbar does Sasha need to complete the kite?
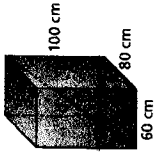
   Ⓐ 4 inches
   Ⓑ √32 inches
   Ⓒ 8 inches
   Ⓓ 16 inches

   4 in.   4 in.   crossbar
   $4^2 + 4^2 = c^2$
   $16 + 16 = c^2$
   $32 = c^2$
   $\sqrt{32} = c$
   Isosceles Right
   $4\sqrt{2}$
   4×1.414 approx

4. Julian forgot his bat when he left for baseball camp. His mother finds a box to ship it to him with the dimensions shown. If the bat measures 34 inches long, will the bat fit inside the box? Explain.

   16 in.   8 in.   32 in.
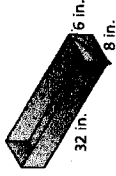
   $32^2 + 10^2 =$
   $1024 + 100$
   $\sqrt{1124} \approx 33.5$

5. A box in the shape of a rectangular prism has the dimensions shown. What is the length of the interior diagonal of the box?

   100 cm   80 cm   60 cm

   Long $\sqrt{10068 + 6^2}$
   $\sqrt{1124} \approx 33.5$

   6 · 80 lb
   3   <1 5
   Ⓓ √1700
   $\sqrt{1414}$ cm

   6 - 8 - ⑩

073

diag of base
Leg
Long
$32.98^2 + 6^2 = c^2$
36

$32^2 + 8^2 = c^2$
$1024 + 64 = c^2$
$1088 = c^2$
$\sqrt{1088} = c$
$\approx 32.98 = c$

≈ 32.96 c^2