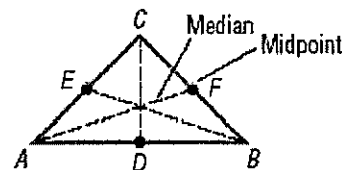


<b>Student:</b> _____ <b>Date:</b> _____	<b>Instructor:</b> Joe Better's <b>Course:</b> Pre-Calculus Pre AP (Master Course)	<b>Assignment:</b> 1.1-1.2 Classwork
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1. The medians of a triangle are the line segments from each vertex to the midpoint of the opposite side (see the figure). Find the lengths of the medians of the triangle with vertices at  $A = (1,2)$ ,  $B = (5,2)$ , and  $C = (3,8)$ .



The length of the median CD is \_\_\_\_\_.  
 (Simplify your answer. Type an exact answer, using radicals as needed.)

The length of the median BE is \_\_\_\_\_.  
 (Simplify your answer. Type an exact answer, using radicals as needed.)

The length of the median AF is \_\_\_\_\_.  
 (Simplify your answer. Type an exact answer, using radicals as needed.)

2. Find the length of each side of the triangle determined by the three points and state whether the triangle is an isosceles triangle, a right triangle, neither of these, or both. (An isosceles triangle is one in which at least two of the sides are of equal length.)

$P_1 = (-2, -3)$ ,  $P_2 = (0,13)$ ,  $P_3 = (7,4)$

$d(P_1, P_2) =$  \_\_\_\_\_ (Type an exact answer, using radicals as needed.)

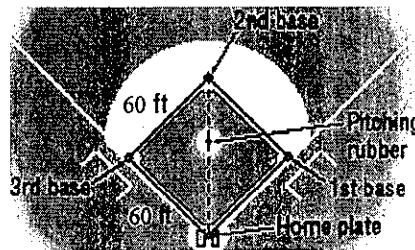
$d(P_1, P_3) =$  \_\_\_\_\_ (Type an exact answer, using radicals as needed.)

$d(P_2, P_3) =$  \_\_\_\_\_ (Type an exact answer, using radicals as needed.)

The triangle is (1) \_\_\_\_\_.

- (1)  an isosceles triangle  
 a right triangle  
 neither of these  
 isosceles right triangle

3. A Little League baseball "diamond" is actually a square, 60 feet on a side (see the figure). What is the distance directly from home plate to second base (the diagonal of the square)?



The distance directly from home plate to second base is approximately \_\_\_\_\_ feet.  
 (Type an integer or decimal rounded to two decimal places as needed.)

4. List the intercepts and test for symmetry.

$$y = \frac{-7x^3}{x^2 - 9}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The intercept(s) is/are \_\_\_\_\_.  
(Type an ordered pair. Use a comma to separate answers as needed. Type each answer only once.)
- B. There are no intercepts.

What are the results of the tests for symmetry? Choose the correct answer below. Select all that apply.

- A. The graph is symmetric with respect to the x-axis.
- B. The graph is symmetric with respect to the y-axis.
- C. The graph is symmetric with respect to the origin.
- D. The graph has no symmetry.

5. If the graph of an equation is symmetric with respect to the x-axis and  $-2$  is a y-intercept of this graph, name another y-intercept.

The known y-intercepts of the graph described above are  $-2$  and \_\_\_\_\_.  
(Type an integer or a simplified fraction.)

6. In studios and on stages, cardioid microphones are often preferred for the richness they add to voices and for their ability to reduce the level of sound from the sides and rear of the microphone. Suppose one such cardioid pattern is given by the equation  $(5x^2 + 5y^2 - 10y)^2 = 100x^2 + 100y^2$ .

- (a) Find the intercepts of the graph of the equation.
- (b) Test for symmetry with respect to the x-axis, y-axis, and origin.

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The intercept(s) is/are \_\_\_\_\_.  
(Type an ordered pair. Use a comma to separate answers as needed. Type each answer only once.)
- B. There are no intercepts.

(b) What are the results of the tests for symmetry? Choose the correct answer below. Select all that apply.

- A. The graph is symmetric with respect to the x-axis.
- B. The graph is symmetric with respect to the origin.
- C. The graph is symmetric with respect to the y-axis.
- D. The graph has no symmetry.

1. 6

$$3\sqrt{2}$$

$$3\sqrt{2}$$

---

2.  $2\sqrt{65}$ 

$$\sqrt{130}$$

$$\sqrt{130}$$

(1) isosceles right triangle

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3. 84.85

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4. A. The intercept(s) is/are (0,0).

(Type an ordered pair. Use a comma to separate answers as needed. Type each answer only once.)

C. The graph is symmetric with respect to the origin.

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5. 2

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6. A. The intercept(s) is/are (0,4),(0,0),(2,0),(-2,0).

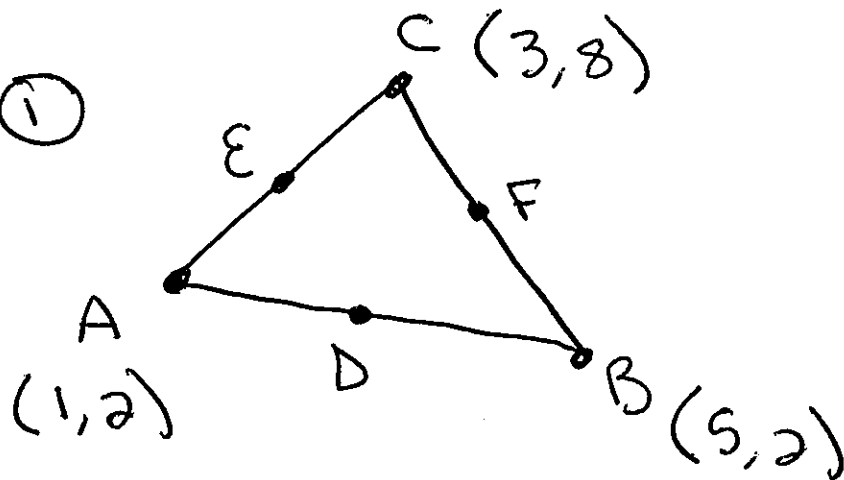
(Type an ordered pair. Use a comma to separate answers as needed. Type each answer only once.)

C. The graph is symmetric with respect to the y-axis.

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Classwork 1.1-1.2

①



$$D \left( \frac{1+5}{2}, \frac{2+2}{2} \right) = (3, 2) \text{ midpoint}$$

$$\overline{CD} = \sqrt{(3-3)^2 + (2-8)^2} = \boxed{6}$$

$$E \left( \frac{3+1}{2}, \frac{8+2}{2} \right) = (2, 5) \text{ midpoint}$$

$$\overline{BE} = \sqrt{(2-5)^2 + (5-2)^2} = \boxed{3\sqrt{2}}$$

$$F \left( \frac{3+5}{2}, \frac{8+2}{2} \right) = (4, 5) \text{ midpoint}$$

$$\overline{AF} = \sqrt{(1-4)^2 + (2-5)^2} = \boxed{3\sqrt{2}}$$

$$\textcircled{2} P_1 = (-2, -3)$$

$$P_2 = (0, 13)$$

$$P_3 = (7, 4)$$

$$d_1(P_1, P_2) = \sqrt{(0 - (-2))^2 + (13 - (-3))^2}$$
$$= \boxed{2\sqrt{65}}$$

$$d_2(P_1, P_3) = \sqrt{(7 - (-2))^2 + (4 - (-3))^2}$$
$$= \boxed{\sqrt{130}}$$

$$d_3(P_2, P_3) = \sqrt{(7 - 0)^2 + (4 - 13)^2}$$
$$= \boxed{\sqrt{130}}$$

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

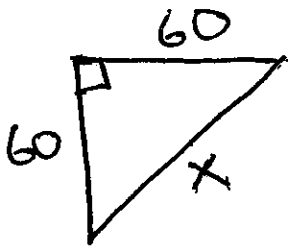
$$(\sqrt{130})^2 + (\sqrt{130})^2 = (2\sqrt{65})^2$$

$$130 + 130 = 260$$

$$260 = 260$$

**Isosceles Right  $\Delta$**

$\textcircled{3}$



$$60^2 + 60^2 = x^2$$

$$x = \boxed{84.85 \text{ feet}}$$

Classwork

1.1-1.2 continued

$$\textcircled{4} \quad y = \frac{-7x^3}{x^2-9}$$

List Intercepts  
and test for symmetry

X-intercept

$$0 = \frac{-7x^3}{x^2-9}$$

$$x = 0$$

$$(0, 0)$$

y-intercept

$$y = \frac{-7(0)^3}{(0)^2-9}$$

$$y = 0$$

$$(0, 0)$$

Symmetry x-axis

$$-y = \frac{-7x^3}{x^2-9}$$

$$y = \frac{7x^3}{x^2-9}$$

no

Symmetry y-axis

$$y = \frac{-7(-x)^3}{(-x)^2-9}$$

$$y = \frac{7x^3}{x^2-9}$$

no

Symmetry origin

$$-y = \frac{-7(-x)^3}{(-x)^2-9}$$

$$-y = \frac{7x^3}{x^2-9}$$

$$y = \frac{-7x^3}{x^2-9}$$

yes

Symmetric  
with origin

⑤ Symmetric to x-axis

means  $y = -y$

If 2, then  $\boxed{-2}$

$$\textcircled{6} (5x^2 + 5y^2 - 10y)^2 = 100x^2 + 100y^2$$

x-intercept

$$(5x^2 + 5(0)^2 - 10(0))^2 = 100x^2 + 100(0)^2$$

$$25x^4 = 100x^2$$

$$x^2 = 4$$

$$x = \pm 2$$

$$\boxed{(2, 0), (-2, 0)}$$

y-intercept

$$(5(0)^2 + 5y^2 - 10y)^2 = 100(0)^2 + 100(y^2)$$

$$(5y^2 - 10y)^2 = 100y^2$$

$$5y^2 - 10y = 10y$$

$$5y^2 - 20y = 0$$

$$5y(y - 4) = 0$$

$$y = 0$$

$$y = 4$$

$$\boxed{(0, 4), (0, 0)}$$

Symmetric with respect to y-axis