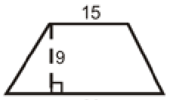
Bell Ringer

8.3 Areas of Trapezoids, Rhombuses, and Kites

Find the perimeter and area of each figure. find area only

1.


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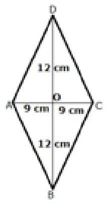

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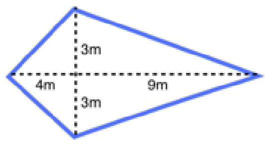
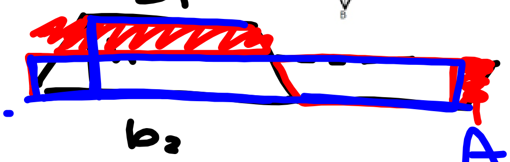


$\frac{1}{2}(9)(15+23)$



$A = b \cdot h$

$A = \frac{1}{2}h(b_2 + b_1)$

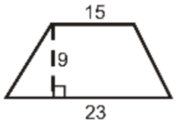
4. If $f(x) = 2x + 3$ and $g(x) = x - 5$, find $(f \circ g)(5)$

Solutions

8.3 Areas of Trapezoids, Rhombuses, and Kites

Find the perimeter and area of each figure.

1.



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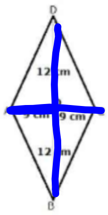
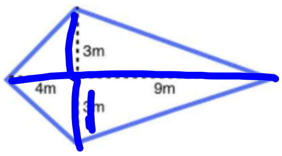


3.



$\frac{1}{2}(13)(6)$

171 units²

216 cm^2

$\frac{1}{2}(24)(18)$

39 m^2

4. If $f(x) = 2x + 3$ and $g(x) = x - 5$, find $(f \circ g)(5)$ 3

$f(g(5))$

$g(5) = 5 - 5 = 0$

$f(0) = 3$

correct 8.2

hw 8.2 #s 8-12, 14-17, 21-27 odds, 36-40 evens

8. 200 m^2

9. 64 ft^2

10. 96 cm^2

11. 36 $in.^2$

12. No; explanations may vary. Sample: two altitudes of an obtuse △ lie outside the △. The legs of a right △ are two altitudes of the △.

14. The area of △*ABC* is half the area of the ▱.

15. 4 in.

16. B

17. 14 cm

~~18. 16~~

21. 15 $units^2$

23. 6 $units^2$

25. 27 $units^2$

27. 21 $units^2$

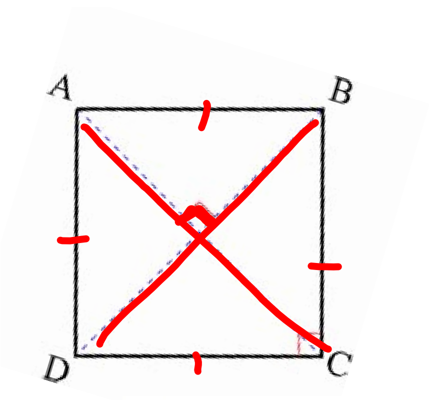
36. 20 $units^2$

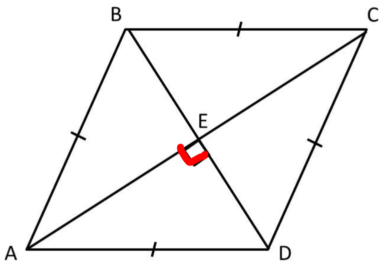
38. 312.5 ft^2

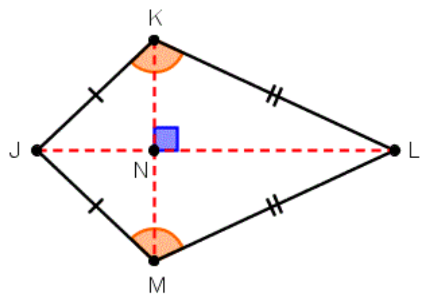
40. 12,800 m^2

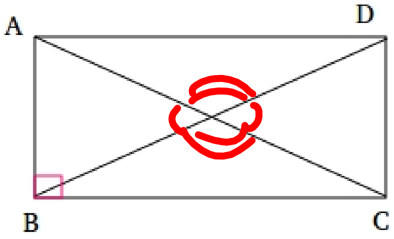
due tomorrow
8.3 #s 7-12, 14-17, 20-24

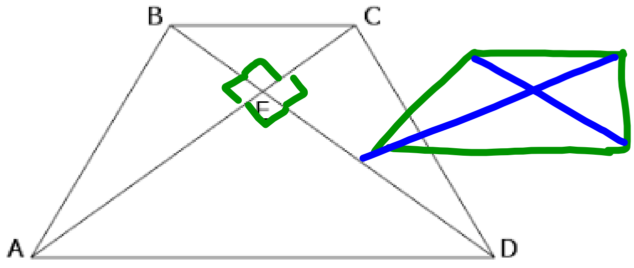
Diagonals...











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8-4 Polygons in the Coordinate Plane

Objective To classify polygons in the coordinate plane

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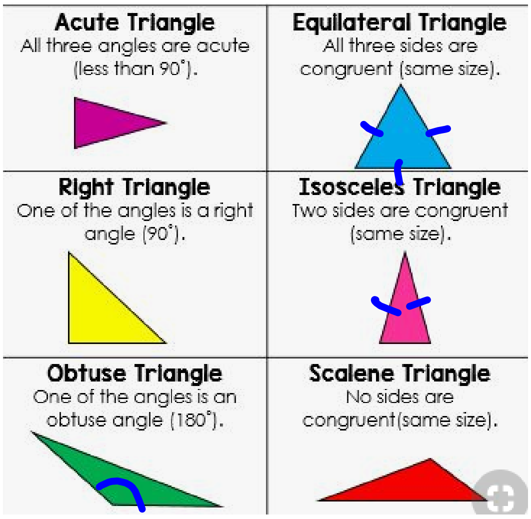
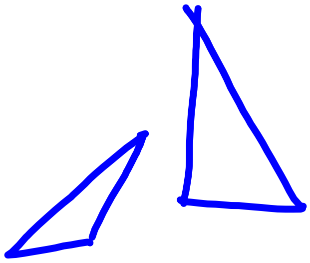
Triangle classification...

Angles Sides





$a^2+b^2=c^2$ not in book

How could we do this...?

Isosceles ★

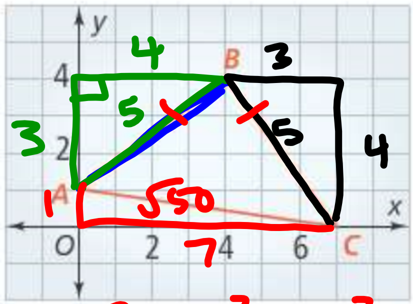
Problem 1 Classifying a Triangle

Is $\triangle ABC$ scalene, isosceles, or equilateral?

$3^2+4^2=c^2$

$\sqrt{25}=\sqrt{c^2}$

$5=c$



$1^2+7^2=c^2$

$\sqrt{50}=\sqrt{c^2}$

2

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In the Solve It, you formed a polygon on a grid. In this lesson, you will classify polygons in the coordinate plane.

Essential Understanding You can classify figures in the coordinate plane using the formulas for slope, distance, and midpoint.

The chart below reviews these formulas and tells when to use them.

take note

Key Concept Formulas and the Coordinate Plane

Formula	When to Use It
Distance Formula $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$	To determine whether • sides are congruent • diagonals are congruent
Midpoint Formula $M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$	To determine • the coordinates of the midpoint of a side • whether diagonals bisect each other
Slope Formula $m = \frac{y_2 - y_1}{x_2 - x_1}$	To determine whether • opposite sides are parallel • diagonals are perpendicular • sides are perpendicular

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solution

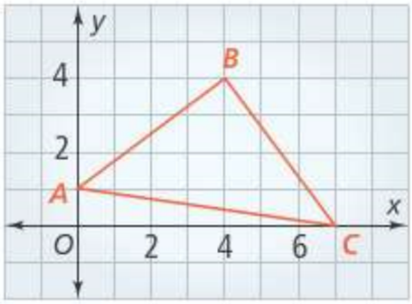
Problem 1 Classifying a Triangle

Is $\triangle ABC$ *scalene, isosceles,* or *equilateral?*

The vertices of the triangle are $A(0, 1)$, $B(4, 4)$, and $C(7, 0)$.
Find the lengths of the sides using the Distance Formula.

$AB = 5$ $BC = 5$ $CA = 5\sqrt{2}$

Since $AB = BC = 5$, $\triangle ABC$ is isosceles.



got it pg 460

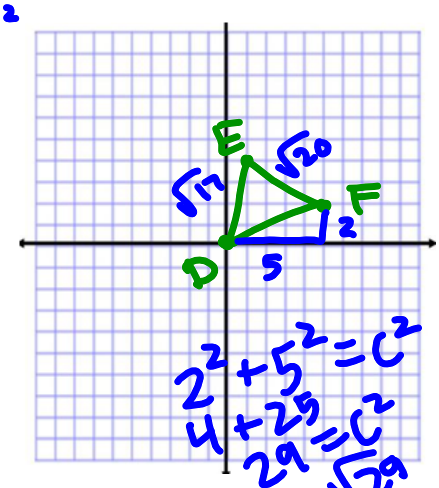
Got It? $\triangle DEF$ has vertices $D(0, 0)$, $E(1, 4)$, and $F(5, 2)$. Show that $\triangle DEF$ is scalene.

(x_1 y_1 … x_2 y_2)

$$\overline{DE} = \sqrt{(1-0)^2+(4-0)^2} = \sqrt{1+16} = \sqrt{17}$$

$$\overline{EF} = \sqrt{(5-1)^2+(2-4)^2} = \sqrt{16+4} = \sqrt{20}$$

$$\overline{FD} = \sqrt{(0-5)^2+(0-2)^2} = \sqrt{25+4} = \sqrt{29}$$



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not in book

Problem 2 Classifying a Quadrilateral

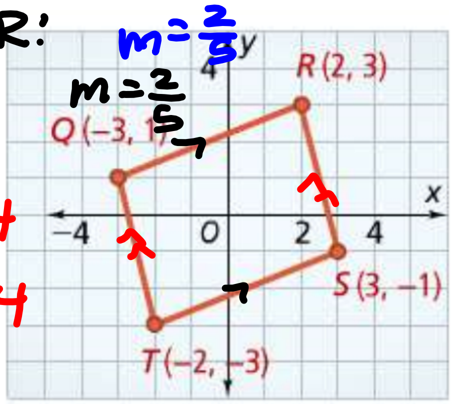
Show that $QRST$ is a parallelogram.

QR: $m = \frac{2}{5}$

TS: $m = \frac{2}{5}$

TQ: $-\frac{4}{1} = -4$

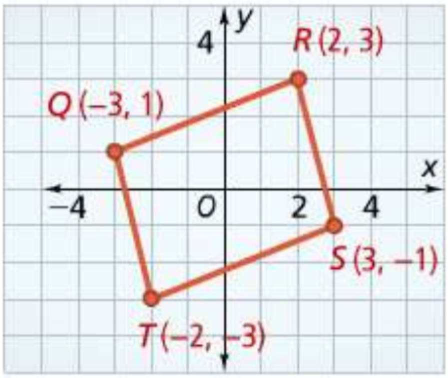
RS: $-\frac{4}{1} = -4$



solution

Problem 2 Classifying a Quadrilateral

Show that *QRST* is a parallelogram.



Step 1 Use the Slope Formula to find the slopes of the sides of *QRST*.

Slope of $\overline{QR}$: $\frac{1-3}{-3-2} = \frac{-2}{-5} = \frac{2}{5}$

Slope of $\overline{RS}$: $\frac{3-(-1)}{2-3} = \frac{4}{-1} = -4$

Slope of $\overline{ST}$: $\frac{-1-(-3)}{3-(-2)} = \frac{2}{5}$

Slope of $\overline{QT}$: $\frac{1-(-3)}{-3-(-2)} = \frac{4}{-1} = -4$

Step 2 Compare the slopes of the opposite sides of *QRST*.

The slopes of opposite sides of *QRST* are equal, so opposite sides are parallel. Therefore, *QRST* is a parallelogram.

got it pg 461

Got It? Parallelogram *MNPQ* has vertices $M(0, 1)$, $N(-1, 4)$, $P(2, 5)$, and $Q(3, 2)$. Show that ▱*MNPQ* is a rectangle

$x_1\ y_1 \quad x_2\ y_2$

MN: $\frac{4-1}{-1-0} = \frac{3}{-1} = -3$

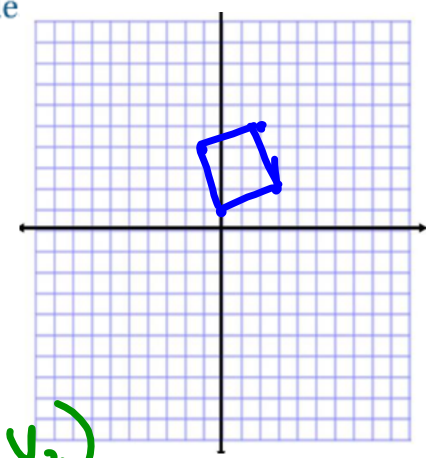
NP: $\frac{1}{3}$

PQ: -3

QM: $\frac{1}{3}$

$$\frac{y_2 - y_1}{x_2 - x_1}$$

$(x_1, y_1)\ (x_2, y_2)$



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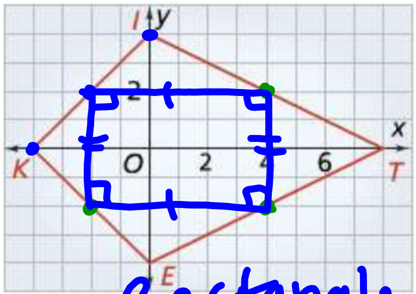
not in book

Problem 3 Classifying a Quadrilateral

A kite is shown at the right. What is the most precise classification of the quadrilateral formed by connecting the midpoints of the sides of the kite?



Rectangle

K(-4,0) I(0,4)

$\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

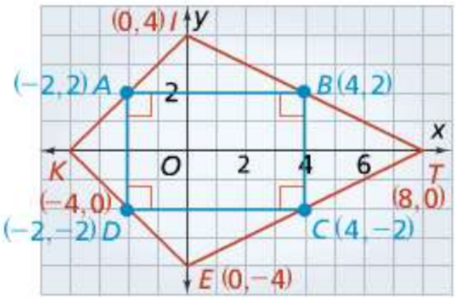
$\left(\frac{-4}{2}, \frac{4}{2}\right)$

→ (-2, 2)

solution

Problem 3 Classifying a Quadrilateral

A kite is shown at the right. What is the most precise classification of the quadrilateral formed by connecting the midpoints of the sides of the kite?



Step 1 Find the midpoint of each side of the kite.

A = midpoint of $\overline{KI}$ = (−2, 2)
B = midpoint of $\overline{IT}$ = (4, 2)
C = midpoint of $\overline{TE}$ = (4, −2)
D = midpoint of $\overline{EK}$ = (−2, −2)

Step 2 Draw a diagram of $ABCD$.

Step 3 Classify $ABCD$.

$AB = 6$ $BC = 4$
$CD = 6$ $DA = 4$

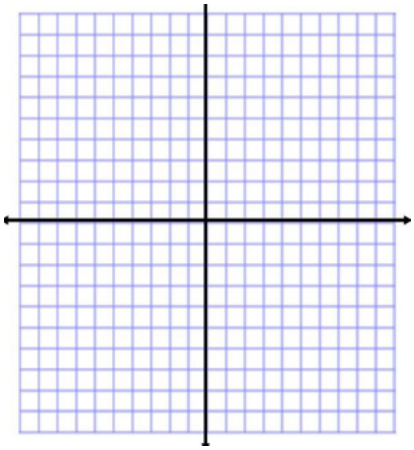
Since opposite sides are congruent, $ABCD$ is a parallelogram.

Since $\overline{AB}$ and $\overline{CD}$ are both horizontal and $\overline{BC}$ and $\overline{DA}$ are both vertical, the segments form right angles.

So, $ABCD$ is a rectangle.

got it pg 461

Got It? An isosceles trapezoid has vertices $A(0, 0)$, $B(2, 4)$, $C(6, 4)$, and $D(8, 0)$. Show that the quadrilateral formed by connecting the midpoints of the sides of $ABCD$ is a rhombus.



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due Thursday
hw 8.4 #s 8-9, 11-12, 15-17, 25-27