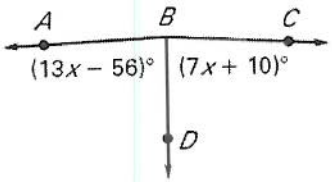
☆ use appropriate units in your answers! and symbols

Tour de Geometry

Stage 1 Semester 1

Team Name: Key

1) $\overrightarrow{BD}$ bisects $\angle ABC$. Find the value of x.



$13x - 56 = 7x + 10$

$6x = 66$

$x = 11$

$x = 11$

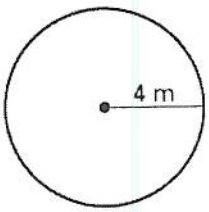
2) The measure of XZ is 27. Find the value of x.

$5x + 2 = 27$

$5x = 25$

$x = 5$

☆ 3) Find the area of the circle. use π button



$A = \pi r^2$

$50.24\ m^2$

$50.27\ m^2$

all sides ≅

4) The expression $-2x + 41$ and $7x - 40$ represent the length of two sides of a regular pentagon. Find the length of each side of the pentagon.

$-2x + 41 = 7x - 40$

$41 = 9x - 40$

$81 = 9x$

$x = 9$

$63 - 40$

23

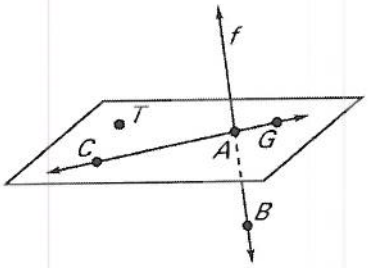
5) $\angle 1$ and $\angle 2$ are supplementary angles. If the measure of $\angle 2 = 115°$, find the $m\angle 1$.

$180 - 115$

$65°$

Use the diagram for questions 6 and 7.

6) Name **two** intersecting lines.



$\overleftrightarrow{CG}$ $\overleftrightarrow{AB}$

$\overleftrightarrow{AG}$ line f

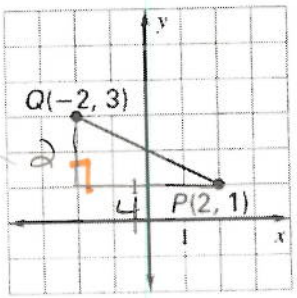
7) Name **four** non-coplanar points.

BAGT

CBAG so many

S1 p2

8) Find the length of the segment. answer in simplified form $2\sqrt{5}$



$4 + 16 = c^2$

$20 = c^2$

$2\sqrt{5}$

$\sqrt{(16)+(4)}$

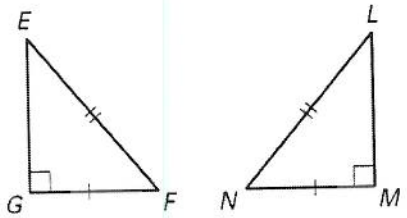
$\sqrt{20}$

$(-2)^2 = -4$

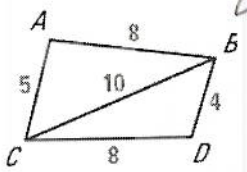
$\sqrt{(2+2)^2+(1-3)^2}$

9) Can you show the triangles are congruent? If so, which theorem or postulate would you use?

(a)



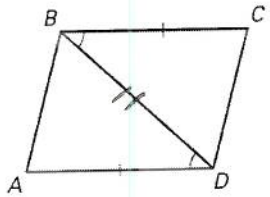
(b)



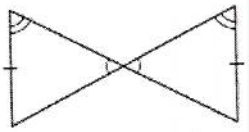
a) yes HL

b) NO

(c)



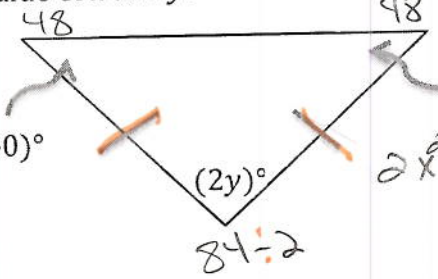
(d)



c) yes SAS

d) yes AAS

10) Find the value of x and y.



$x = 2$

48

$2x^2 - 15x + 70 = 7x^2 + 30x - 40$

$0 = 5x^2 + 45x - 110$

$0 = 5(x^2 + 9x - 22)$

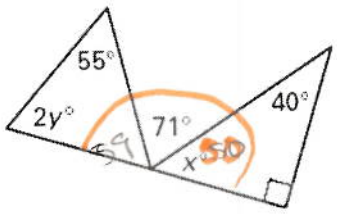
$5(x+11)(x-2)$

$x = -11, 2$

x = 2

y = 42

11) Find the value of x and y.



x = 50°

y = 33

12) Solve the proportion.

$$\frac{2z}{27} = \frac{(3z+9)}{81}$$

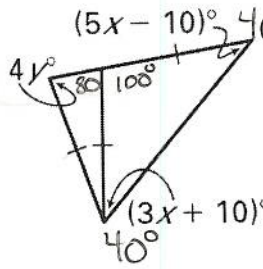
$2z(81) = 27(3z+9)$

$162z = 81z + 243$

$81z = 243$

$z = 3$

13) Find the values of x and y.



$5x-10=3x+10$

$2x=20$

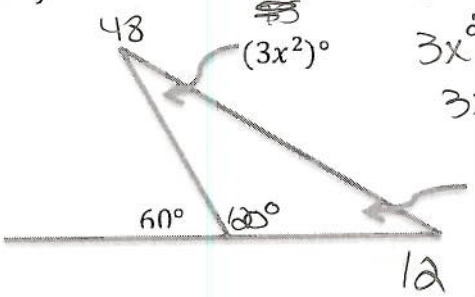
$x=10$

$4y=80$

$x = 10$

$y = 20$

14) Find the value of x in the figure to the right. After, find the measure of each interior angle.



$3x^2-3x+120=180$

$3x^2-3x-60=0$

$3(x^2-x-20)=0$

$3(x-5)(x+4)=0$

$x = -4$

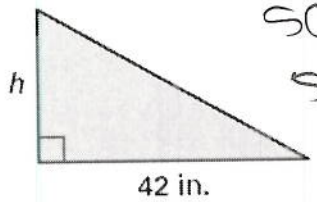
$120°, 48°, 12°$

15) Find the midpoint between points A and B.

$A(10, 2)$ and $B(-8, 3)$ $\left(\frac{2}{2}, \frac{5}{2}\right)$

$(1, 5/2)$

16) The area of the triangle is 504 square inches. Find the height.



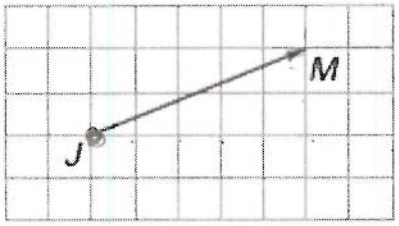
$504=\frac{1}{2}\cdot 42\cdot h$

$504=21\cdot h$

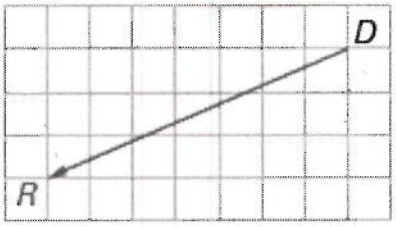
$h = 24$ in.

Name the vector and write it in its component form.

17)



18)

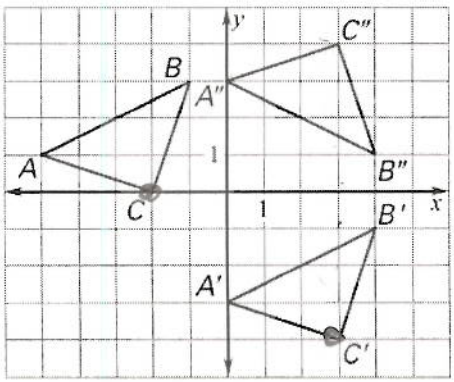


$\vec{JM}\ \langle 5, 2\rangle$

$\vec{DR}\ \langle -7, -3\rangle$

Describe the rule for each transformation.

12.



$ABC \to A'B'C'$ 12. $(x+5, y-4)$

$A'B'C' \to A''B''C''$ reflection over x-axis

Tour de Geometry

Team Name: Key

Stage 2 Semester 1

Multiply the matrices, if possible.

1) $\begin{bmatrix} 4 & -3 \end{bmatrix}\begin{bmatrix} -6 \\ 2 \end{bmatrix}$

$1\times2 \quad 2\times1$

$\begin{bmatrix} -30 \end{bmatrix}$

2) $\begin{bmatrix} -2 & 3 \\ 5 & -4 \end{bmatrix}\begin{bmatrix} -1 & 4 \\ 7 & 5 \end{bmatrix}$

1. $\begin{bmatrix} -30 \end{bmatrix}$

2. $\begin{bmatrix} 23 & 7 \\ -33 & 0 \end{bmatrix}$

3) $\begin{bmatrix} -3 & 3 \\ 3 & -2 \\ 0 & -1 \end{bmatrix}\begin{bmatrix} 1 & 0 \\ -2 & -1 \end{bmatrix}$

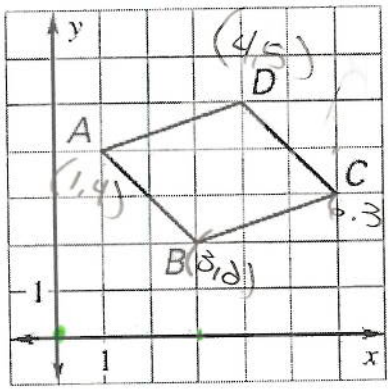
$3\times2 \quad 2\times2$

3. $\begin{bmatrix} -9 & -3 \\ 7 & 2 \\ 2 & 1 \end{bmatrix}$

Find the coordinates of the vertices of the figures after a dilation by the given scale factor.

★ fraction answers

4. Scale Factor: 2



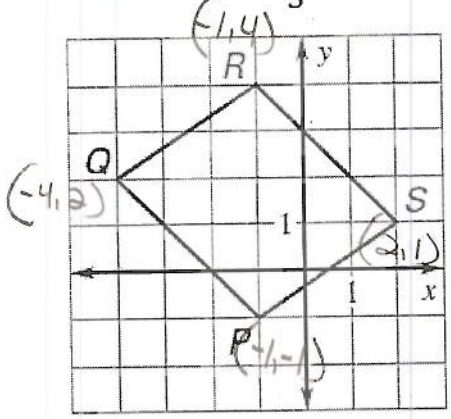
A (2 , 8)

B (6 , 4)

C (12 , 6)

D (8 , 10)

5. Scale Factor: $\frac{2}{3}$



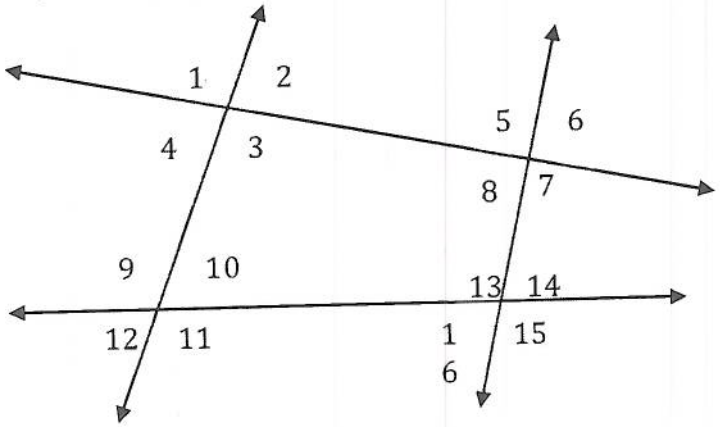
P ($-\frac{2}{3}$, $-\frac{2}{3}$)

Q ($-\frac{4}{3}$, $\frac{4}{3}$)

R ($-\frac{2}{3}$, $\frac{8}{3}$)

S ($\frac{4}{3}$, $\frac{2}{3}$)

6) Classify the angle pair as *corresponding, alternate interior, alternate exterior,* or *consecutive interior.*



∠1 and ∠11 ae

∠2 and ∠5 cons. int.

∠15 and ∠11 corr.
(not ≅ b/c lines not ∥)

∠8 and ∠14 alt. int.

(S2 P2)

7) The measure of one angle is three times the measure of its complement. Find the measure of each angle.

x = 1st ∠
y = 2nd ∠ (complement)

$3y = x$
$x + y = 90$

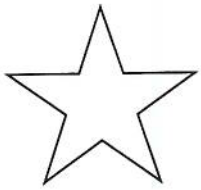
substitute
$3y + y = 90$
$4y = 90$

$y = 22.5°$
$x = 67.5°$

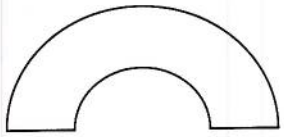
8) Also, how many lines of symmetry? rotational symmetry?

8) Decide whether the figure is a polygon.

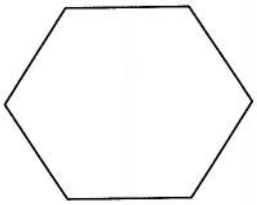
(a)



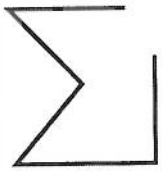
(b)



(c)



(d)



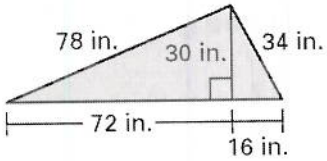
(a) yes, 5 l.o.s., 72°, 144° rot. sym.

(b) no, 1 l.o.s., no rotational

(c) yes, 6 l.o.s., 60°, 120°, 180° rot.

(d) NO

~~9)~~ Find the **perimeter** and the **area** of the triangle.

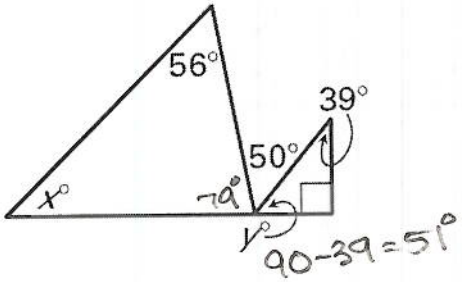


don't need

P = 200 in.

A = 1320 in.²

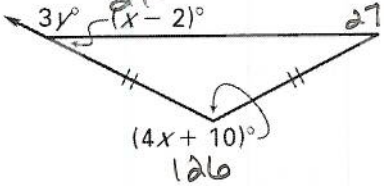
10) Find the values of x and y.



x = 45°

y = 51°

11) Find the values of x and y.



$2(x-2) + 4x + 10 = 180$
$6x + 6 = 180$
$6x = 174$
$x = 29$

$180 - 27 = 34$
$153 = 34$

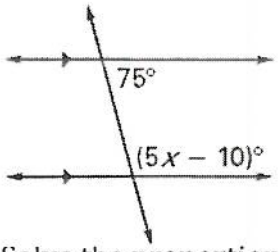
OR

Ext. ∠ theorem
$126 + 27 = 34$
$153 = 34$

x = 29

y = 51

12) Find the value of x.



52 p 3

$75 + 5x - 10 = 180$

$x = 23$

13) Solve the proportion

$$\frac{2x}{x+15} = \frac{-1}{x-6}$$

	x	-3
$2x$	$2x^2$	$-6x$
-5	$-5x$	15

$2x(x-6) = -x-15$

$2x^2 - 12x = -x - 15$

$2x^2 - 11x + 15 = 0$

30 → $-6, -5$

$(x-3)(2x-5) = 0$

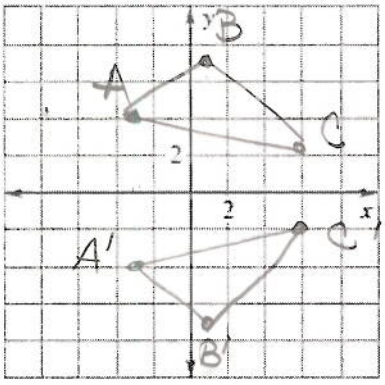
$x - 3 = 0 \quad 2x - 5 = 0$

$x = 3$

$x = 5/2$

Perform the given transformation. plot both

14. Reflect $\begin{bmatrix} A & B & C \\ -3 & 1 & 6 \\ 4 & 7 & 2 \end{bmatrix}$ in the x-axis.



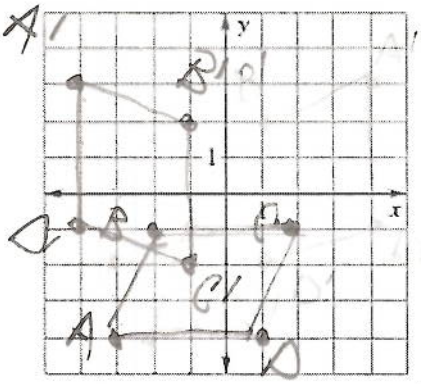
y coord opposite

$A'(-3, -4)$

$B'(1, -7)$

$C'(6, -2)$

15. $\begin{bmatrix} A & B & C & D \\ -3 & -2 & 2 & 1 \\ -4 & -1 & -1 & -4 \end{bmatrix}$; 270°



switch x, y both opposite

$A'(-4, 3)$

$B'(-1, 2)$

$C'(-1, -2)$

$D'(-4, -1)$

16. $\begin{bmatrix} A & B & C \\ 3 & 1 & 5 \\ 1 & 5 & 3 \end{bmatrix}$

Translation: $(x, y) \rightarrow (x - 6, y + 1)$

Rotation: 90° about the origin

A' (−3, 2)

B' (−5, 6)

C' (−1, 4)

A" (−2, −3)

B" (−6, −5)

C" (−4, −1)

y-axis $(-x, y)$

x-axis $(x, -y)$

$y = x$ (y, x)

90° $(-y, x)$

180 $(-x, -y)$

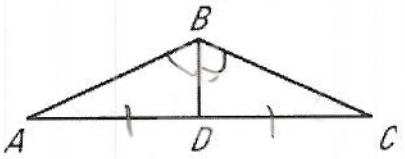
270° $(y, -x)$

Use the diagram and the given information to list all possible names for segment *BD*.

17) $\overline{AD} \cong \overline{CD}$

18) $\overline{BD} \perp \overline{AC}$ and $\overline{AD} \cong \overline{CD}$

19) $\angle ABD \cong \angle CBD$

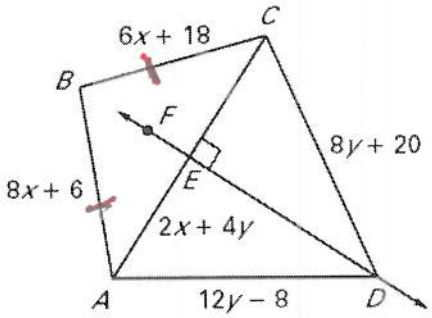


BD median

⊥ bisector altitude median

angle bisector median

20) *DE* is the perpendicular bisector of *AC*. Find the indicated measures.



$AD =$ 76

$AB =$ 54

$AE =$ 40

$AC? = 80$

$12y - 8 = 8y + 20$

$12y = 8y + 28$

$4y = 28$

$y = 7$

$AD = 12(7) - 8$

$6x + 18 = 8x + 6$

$12 = 2x$

$x = 6$

$AB = 8(6) + 6$

$AE = 2(6) + 4(7)$

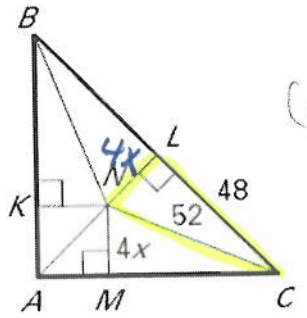
Tour de Geometry

Team Name: Key

Stage 3 Semester 1

1) Find the value of x that makes N the **incenter**.

1) $x = 5$



$(4x)^2 + 48^2 = 52^2$

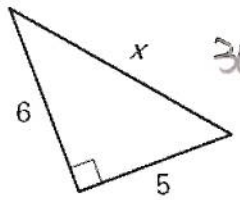
$16x^2 + 2304 = 2704$

$16x^2 = 400$

$x^2 = 25$

2) Find the missing length in simplest radical form.

(a)

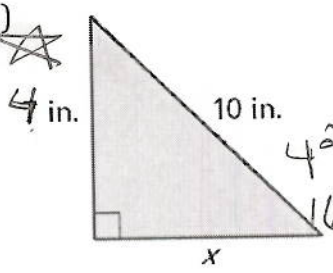


$36 + 25 = x^2$

$61 = x^2$

a) $x = \pm\sqrt{61}$

(b)



$4^2 + x^2 = 10^2$

$16 + x^2 = 100$

$x^2 = 84$

b) $x = \pm 2\sqrt{21}$

Add or subtract the matrices.

3.

$$\begin{bmatrix} 5 & -2 \\ 2 & 4 \\ -7 & 2 \end{bmatrix} + \begin{bmatrix} 1 & 3 \\ 6 & -4 \\ 6 & -1 \end{bmatrix}$$

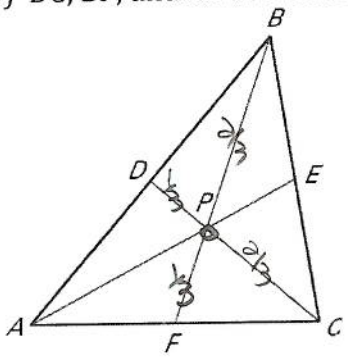
$$\begin{bmatrix} 6 & 1 \\ 8 & 0 \\ -1 & 1 \end{bmatrix}$$

4.

$$[-0.3 \quad 1.8] - [0.6 \quad 2.7]$$

$$[-.9 \quad -.9]$$

5) DC, BF, and AE are medians. (a) What is point P called? (b) If $BF = 15$, find BP and PF.



a) centroid

$BP = 10$

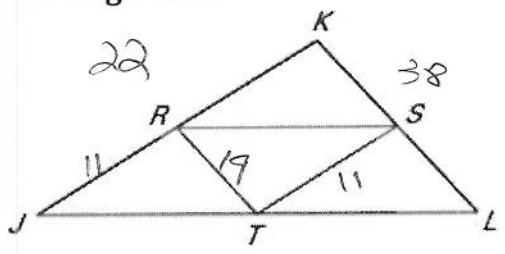
$PF = 5$

S3 p2

In the diagram below, *RS*, *RT*, and *ST* are midsegments.

6) If *KL* is 38, find *RT*

RT = 19



7) If *ST* is 11, find *RJ*

RJ = 11

8) The measure of the angles of a triangle are in the ratio of 2:4:5. Find the measures of each angle.

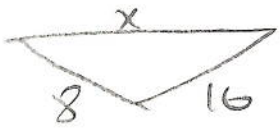
13

Angle 1: _____

Angle 2: _____

Angle 3: _____

9) A triangle has one side length of 8 and another length 16, write an inequality describing the possible lengths of the third side.



$8+16>x$

$x<24$

$8+x>16$

$x>8$

7

$16+x>8$

$x>-8$

$8<x<24$

~~pgs~~ look @ both exp.

ch. 5

Alt. review 5.1-5.5 notes and on chapter