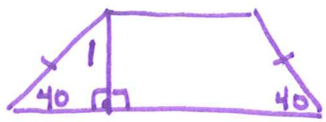
Key

Reviewing what we know for 6.6 &6.7 Warm Up

Basic Review

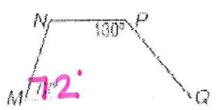
1. M(-4,5), N(2,2), P (0,-2), Q(-6,1)
   What is the most specific name of this figure?

2. Quadrilateral $MNPQ$ has vertices $M(4, 0)$, $N(0, 6)$, $P(-4, 0)$ and $Q(0, -6)$. Determine whether $MNPQ$ is a *trapezoid*, a *parallelogram*, a *square*, a *rhombus*, or a *quadrilateral*. Choose the most specific term. Explain.



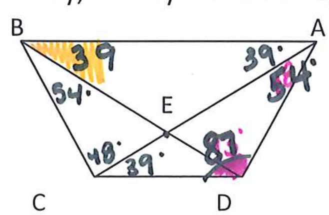
6.6 Review Warm Up

1. Find <N and <Q.



$\angle N = 108°$
$\angle Q = 50°$

2. If ABCD is and isosceles trapezoid with AC= 5y, BE= 4y-1 and DE= 2y-1. Find y.



AC = BD
AC = BE + DE
5y = 4y − 1 + 2y − 1
5y = 6y − 2
−1y = −2
$\boxed{y = 2}$

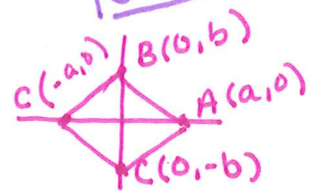
3. Use isosceles trapezoid ABCD from #2. If m<ACD= 39°, and <BCA=48°, find m<ABD.

$\triangle CEB \cong \triangle DEA$

6.7 Review

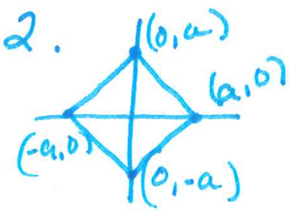
1. $ABCD$ is a rhombus with $A(a, 0)$, $B(0, b)$, and $D(0, -b)$. Find the possible coordinates of C.

1. C(-a,0)



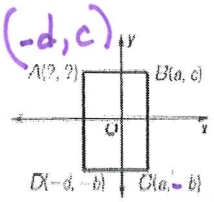
2. $ABCD$ is a square with $A(a, 0)$, $B(0, a)$, and $C(-a, 0)$. Find the possible coordinates of D.

2. D(0,-a)



3. Given rectangle $ABCD$, name the coordinates of A.

(-d,c)

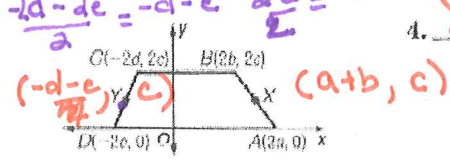


3. A(-d,c)

X (a+b,c)

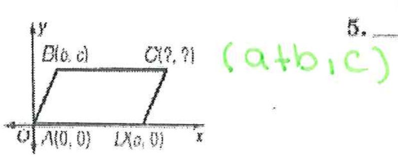
4. Name the coordinates of the endpoints of the median of trapezoid $ABCD$.

$\frac{-2d-2e}{2} = -d-e$ $\frac{2c}{2} = c$



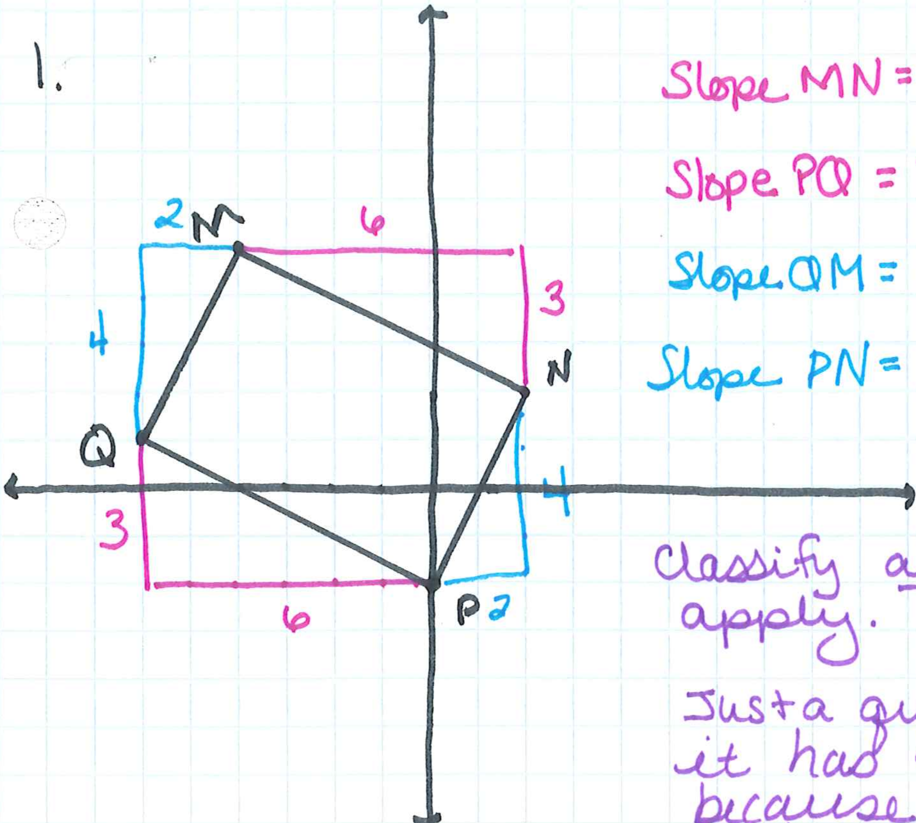
4. Y (-d-e, c)

5. Name the missing coordinates of C in parallelogram $ABCD$.



5. C(a+b,c)

1.



Slope $MN = \frac{-3}{6} = -\frac{1}{2}$

Slope $PQ = \frac{-3}{6} = -\frac{1}{2}$

Slope $QM = \frac{4}{2} = 2$

Slope $PN = \frac{4}{2} = 2$

MN, PQ: //; MN, QM: ⊥; QM, PN: //; ⊥

$NM^2 = 6^2 + 3^2$
$= \sqrt{45}$
$\boxed{MN = 3\sqrt{5}}$

$\boxed{QP = 3\sqrt{5}}$

$MN \cong QP$

$NQ^2 = 4^2 + 2^2$
$= \sqrt{20}$
$\boxed{MQ = 2\sqrt{5}}$

$\boxed{NP = 2\sqrt{5}}$

$NP \cong MQ$

Classify all that apply.

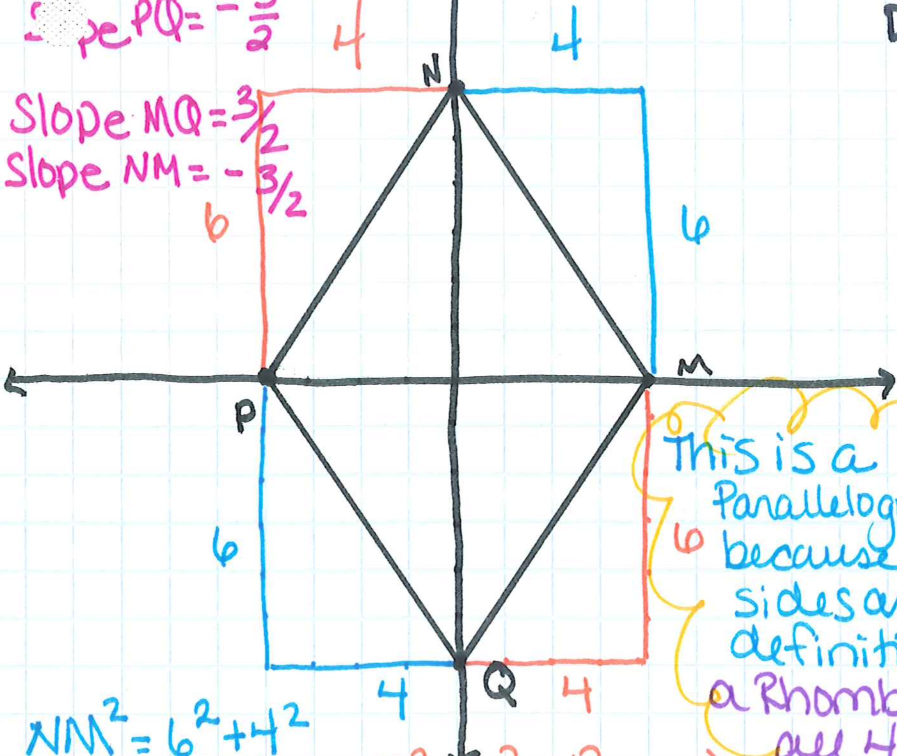
Just a quadrilateral because it has 4 sides + a parallelogram because op. sides are //, by definition! rectangle by def because consecutive sides are ⊥.

2. Slope $PN = \frac{6}{4} = \frac{3}{2}$

PN // MQ
PQ // NM

Slope $PQ = -\frac{3}{2}$

Slope $MQ = \frac{3}{2}$
Slope $NM = -\frac{3}{2}$



This is a Parallelogram because op sides are // by definition and a Rhombus because all 4 sides are $\cong$.

$NM^2 = 6^2 + 4^2$
$= \sqrt{52}$
$\boxed{NM = 2\sqrt{13}}$

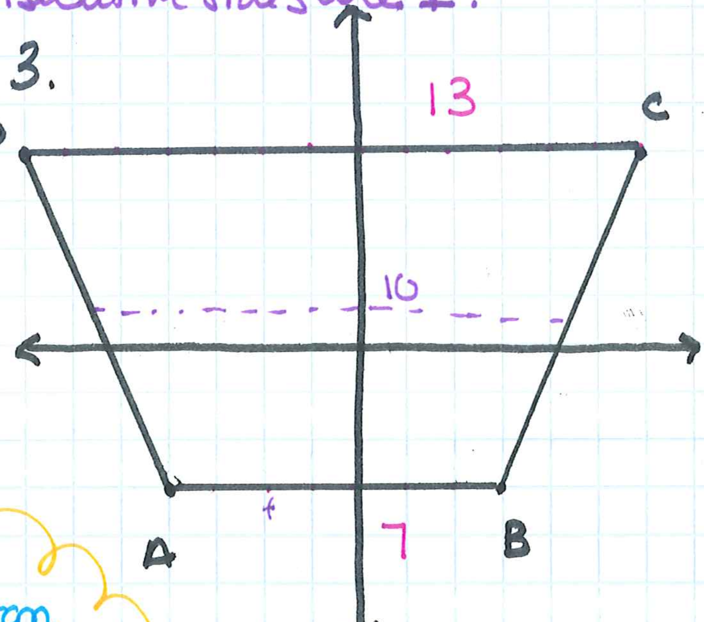
$NP^2 = 6^2 + 4^2$
$\boxed{NP = 2\sqrt{13}}$

$MQ^2 = 6^2 + 4^2$
$\boxed{MQ = 2\sqrt{13}}$

$PQ^2 = 6^2 + 4^2$
$\boxed{PQ = 2\sqrt{13}}$

ALL 4 $\cong$ sides

3.

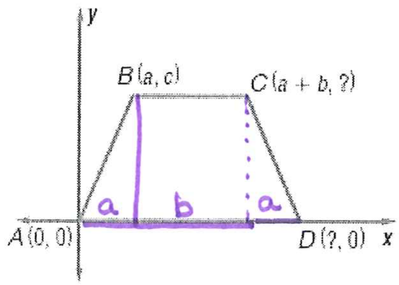


Find the length of the median.

$Med = \frac{1}{2}(13 + 7)$

$\boxed{\text{Median} = 10}$

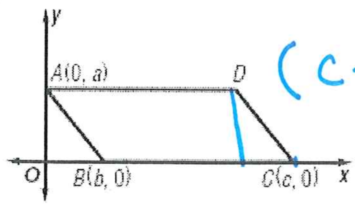
Ex6 Name the missing coordinates for the isosceles trapezoid.



C $(a+b, c)$

D $(2a+b, 0)$

Ex7 In the figure, ABCD is a parallelogram. What are the coordinates of point D?

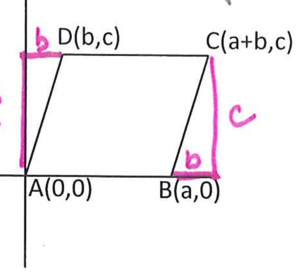


$(c-b, a)$

$\sqrt{(b+c)^2} = \sqrt{(b+c)(b+c)}$

$\sqrt{b^2+2cb+c^2} \neq \sqrt{b^2+c^2}$

Ex8 Write a coordinate proof to show that opposite sides of a parallelogram are congruent.



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

$AB = a$

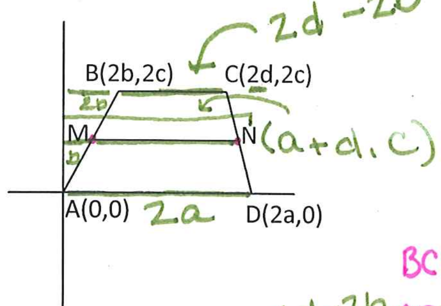
$DC = a$ } $\cong$

$BC = \sqrt{b^2+c^2}$ } $\cong$

$AD \cong BC$ and $AB \cong DC$

$\therefore$ op. sides of a Parallelogram are $\cong$

Ex9 Write a coordinate proof to find the length of the median?



$\boxed{\text{Method 1}}$

Find M

$\left(\frac{0+2b}{2}, \frac{0+2c}{2}\right)$

$M(b, c)$

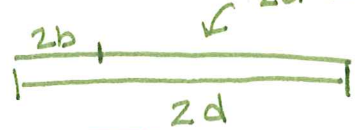
Find N

$\left(\frac{2a+2d}{2}, \frac{0+2c}{2}\right)$

$N(a+d, c)$

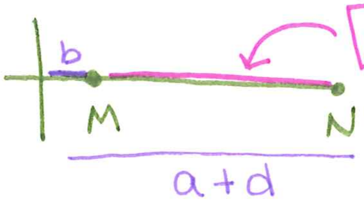
$BC = 2d-2b$

$AD = 2a$



Find the length of MN

$\boxed{a+d-b = MN}$



look Same!

$\boxed{\text{Method 2}}$

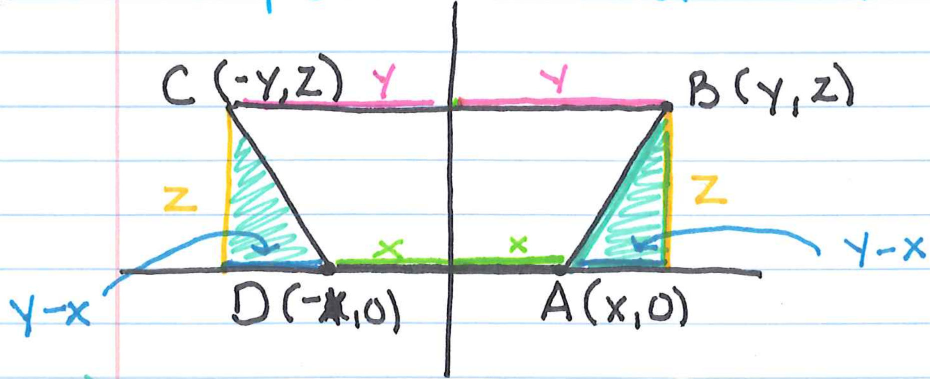
$MN = \frac{1}{2}(BC + AD)$

$MN = \frac{1}{2}(2d-2b+2a)$

$MN = d-b+a$

or $\boxed{MN = a+d-b}$

Trapezoid Coord. Proof Example.



1.) prove that ABCD is a trapezoid.

1 pair of op. sides // ← $\boxed{\text{SLOPES}}$

Slope CB = $\frac{0}{2y} = 0$
Slope AD = $\frac{0}{2x} = 0$ > CB // AD

Slope CD = $-\frac{z}{y-x}$
Slope AB = $\frac{z}{y-x}$ > CD ∦ AB

∴ ABCD is a trap. w/ one pair of // sides.

2.) Prove that trapezoid ABCD ← Fact (No proving // sides) is isosceles.

distance (legs ≅)

$(y-x)^2 + z^2 = AB^2$

$\boxed{\sqrt{(y-x)^2 + z^2} = AB}$

$(y-x)^2 + z^2 = CD^2$

$\boxed{\sqrt{(y-x)^2 + z^2} = CD}$

AB ≅ CD
∴ trap. ABCD is isosceles.