

## GEOMETRY – journal questions – MPM

Summarize everything you need to know about these topics. Use examples and concise (not long – but with enough detail) explanations. Include definitions and diagrams if necessary

### 1. MIDPOINT and SLOPE of a LINE SEGMENT

a) Copy/Paste the formulas

SLOPE formula $m = \frac{y_2 - y_1}{x_2 - x_1}$	MIDPOINT formula $M = \left( \frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$	b) Find OTHER endpoint of line segment AB if midpoint is at M(2, -5) and one endpoint is at A(-6, 9). Include picture and explanations.
c) MEDIAN line Find the equation of the median line from point B(-3,1) to line AC where A(-4, -6) and C(6,0). Include picture and explanations.	d) Properties of lines Explain what you should know about the slopes of parallel lines, perpendicular lines, vertical lines and horizontal lines.	e) PERPENDICULAR BISECTOR line Find the equation of the perpendicular bisector line bisecting segment AB if A(-1,-7) and B(5, -4). Include picture and explanations.

### 2. DISTANCE/LENGTH of a LINE SEGMENT

a) Copy/Paste the formula

DISTANCE formula $D = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$	b) How does distance formula relate to Pythagorean Theorem?	c) Copy and paste the classifying diagrams on the next page and use them to classify the following shape: P(-1,3), Q(5,4), R(4, -2), and S(-2, -3)
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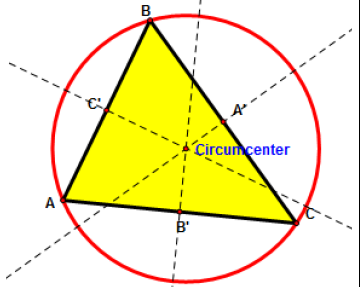
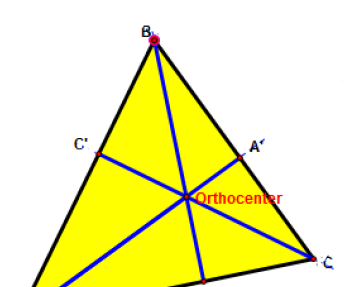
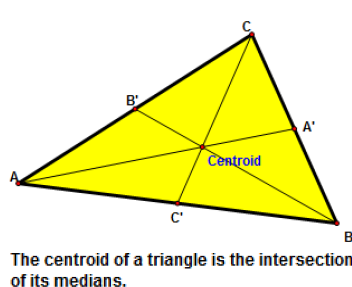
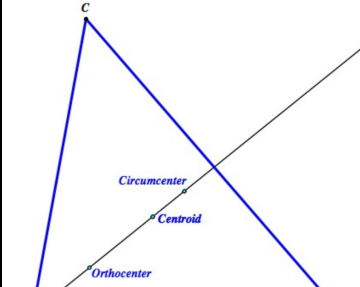
### 3. CIRCLES

a) Copy/Paste the formula

CIRCLE formulas Circles centred at (0,0) : $x^2 + y^2 = r^2$ Circles centred at (h, k) : $(x - h)^2 + (y - k)^2 = r^2$	b) TANGENT line Find the equation of the tangent line of a circle at point B(7, -3) which is on the circle that is centered at origin. Include picture and explanations.	PRACTICE c) Find the equation of a circle centered at the origin and passing through point (-4, 7) d) If the equation is $x^2 + y^2 = 5$ , what is the radius?
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### 4. APPLICATIONS

a) Copy/Paste the following definitions

<b>CIRCUMCENTRE</b>  The circumcenter of a triangle is the center of the circle that pass through all three vertices of the triangle. It is constructed as the intersection of the perpendicular bisectors of the sides.	<b>ORTHOCENTRE</b>  The orthocenter of a triangle is the intersection of the triangle's altitudes.	<b>CENTROID</b>  The centroid of a triangle is the intersection of its medians.	<b>EULER line</b>  In any triangle, the centroid, circumcenter and orthocenter always lie on a straight line, called the Euler line.
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b) ALTITUDE line

Find the equation of the altitude line from point C(6,0) to line AB where A(-4, -6) and B(-3,1). Include picture and explanations.

c) SHORTEST DISTANCE

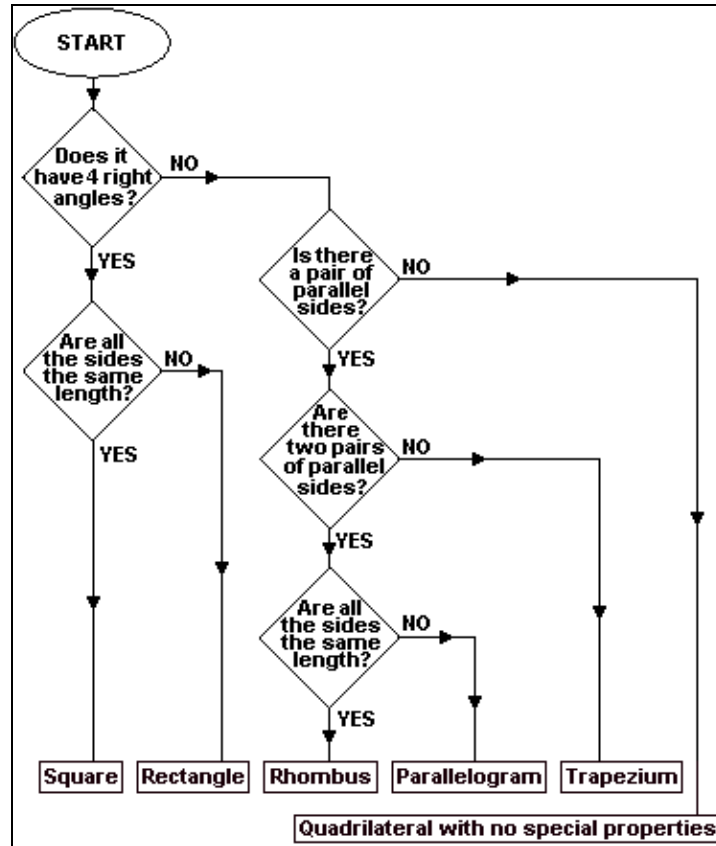
Find the shortest distance from point P(5,6) to line  $y = -3x + 1$

PRACTICE – do ONE of the THREE below

- d) Find the orthocenter of if D(-2,2), E(6, 6) F(2, -6). Would orthocenter always be one of the vertices of the triangle, why or why not?
- e) Find the circumcenter of the circle that passes through points D(-5,6), E(-2,7) and F(2, 5)
- f) Find the centroid of  $\Delta PQR$  if P(-2,4), Q(6,2) and R(-4, -2). Verify that the shortcut formula will yield the same answer

$$C = \left( \frac{x_1 + x_2 + x_3}{3}, \frac{y_1 + y_2 + y_3}{3} \right)$$

## CLASSIFYING Quadrilaterals



## CLASSIFYING Triangles

