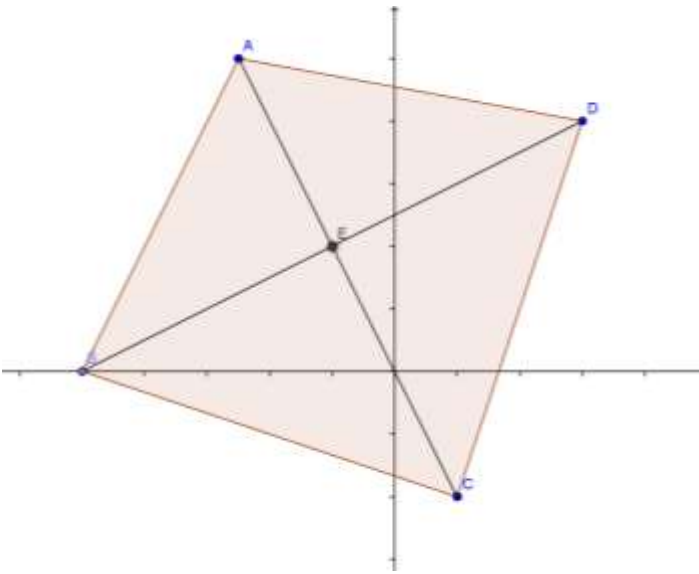
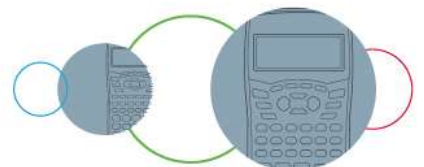


SHARP

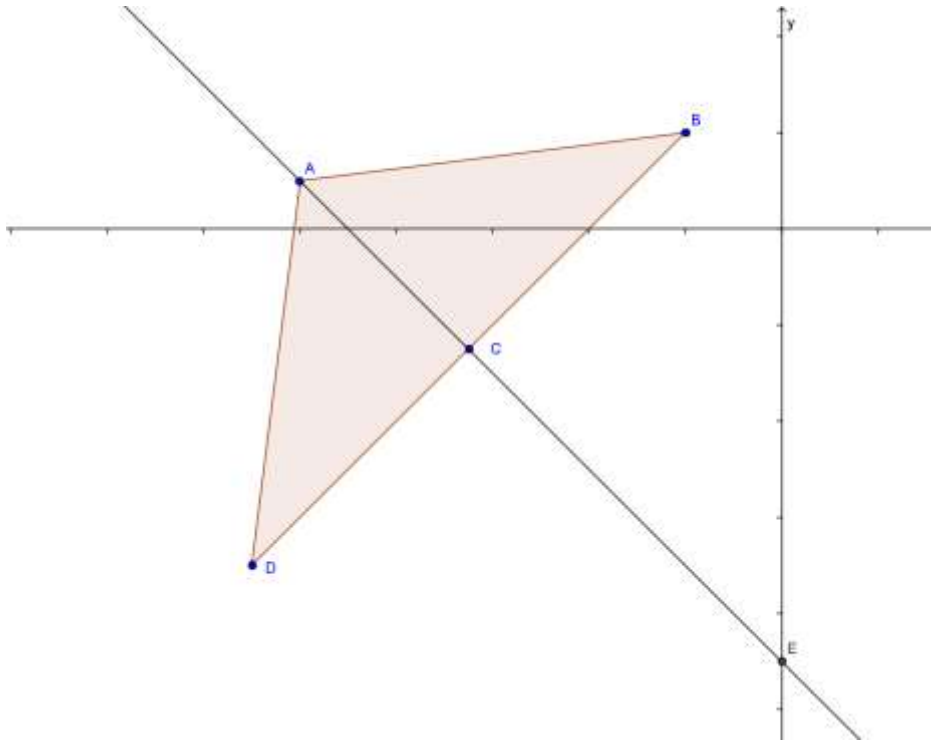
Worksheet 12 – Analytical Geometry

Grade 10 – Mathematics

1. Given the parallelogram ABCD with coordinates A (4; 4), B (x; y), C (-2; -2) and D (2, 0).
- a) Determine the coordinates of E the midpoint of A and C. (R)
 - b) If E is also the midpoint and D and B, determine the coordinates of B. (C)
 - c) Determine the distance of AB, BC, CD, AD. (R)
 - d) What geometric shape is the parallelogram? Give a reason for your answer. (C)
 - e) Determine the equation of the straight line through A and C. (R)
 - f) Determine the equation of the straight line through B and D. (R)
 - g) Is the straight line AC perpendicular to BD? Show all your working out. (C)
2. Given the following quadrilateral with coordinates ABCD. Given that A is (-2.5; 5), B is (-5; 0), D is (3; 4).
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- a) Determine the midpoint E of BD. (R)
 - b) Determine the length of AB. (R)
 - c) Prove that AEC is perpendicular to BED. (P)
 - d) Using Pythagorus, determine the length of AE. (C)
 - e) Determine the area of triangle ABE. (C)
 - f) Determine the length of AC given that the length of DC is $2\sqrt{10}$. (P)
 - g) Determine the coordinates of C, given that the line through DC passes through the y-axis at -5. (P)
 - h) Determine the length of AD and BC. (R)
 - i) What kind of geometric shape is ABCD? Give 2 reasons for your answer. (P)



3. Given the sketch below with coordinates B (-2; 2) and D (-11, -7).



- a) Determine the midpoint, C, of BD. (R)
 - b) Given that AC is perpendicular to BD, determine the equation of AE, and hence the coordinates of E. (C)
 - c) Given that the equation of AB is $8y = x + 18$, determine the coordinates of A. (P)
 - d) Determine the length of AD and AB. (R)
 - e) What can you say about triangle ADB? Give a reason for your answer. (C)
 - f) Given that the coordinate B is shifted to (-2; 0).
 - i) Determine the new distance AB. (R)
 - ii) Hence, what type of triangle is ABD now? (C)
4. Given triangle MNP with coordinates M (1; 6), N (4; -5) and P (6; 5).
- a) Determine the equation of the line NP. (R)
 - b) Determine the equation of the line MP. (R)
 - c) Prove that triangle MNP is a right angled triangle. (C)
 - d) Determine the midpoint Q of MN, the midpoint R of NP and the midpoint S of MP. (R)
 - e) Determine T, the point where QP, MR and NS intersect. (P)
 - f) Determine the area of triangle MNP and triangle NPR. (P)

