MAT2500-03/04 10S Quiz 1    Print Name (Last, First) _____|__
Show all work, including mental steps, in a clearly organized way that speaks for itself. Use proper
mathematical notation, identifying expressions by their proper symbols (introducing them if necessary), and use
arrows and equal signs when appropriate. Always simplify expressions. BOX final short answers. LABEL parts
of problem. Keep answers EXACT (but give decimal approximations for interpretation). Indicate where
technology is used and what type (Maple, GC).

Given three points $P_1(1, 2)$, $P_2(-1, 4)$, $P_3(5, 3)$ in the plane:

a) On the reverse side of this sheet (left grid), draw in the three points and their position vectors, labeling each
point and vector, and draw in the triangle the points determine, labeling the three sides by appropriate symbols
for their difference vectors (put in arrow heads to indicate which direction your vector symbol for each side
refers to).

b) Evaluate the angle of the triangle at the vertex $P1$ exactly (no decimals) and numerically to the nearest tenth
of a degree. Does your result seem consistent with your graph? Explain.

c) On the reverse side of this sheet (right grid), draw in only the position vectors of the first two points and draw
in the rectangle used to graphically project the second position vector parallel and perpendicular to the first
vector, labeling the vectors and sides of the rectangle with appropriate notation for those projections. Estimate
roughly the components of the two vector projections.

d) Now using appropriate notation, step by step (show every step starting from the initial vector components)
evaluate the vector components of the parallel and perpendicular projections that you have drawn exactly and
then to 2 decimal place accuracy.

e) How do your numerically evaluated exact vectors compare to your graphical estimates? Explain.

► **solution**