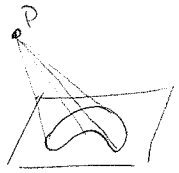
Quiz 2



Key

Part A: [1] True/False. No partial credit is given.

T (F) The bases of all cones are circles.

(T) F All regular polyhedra are convex.

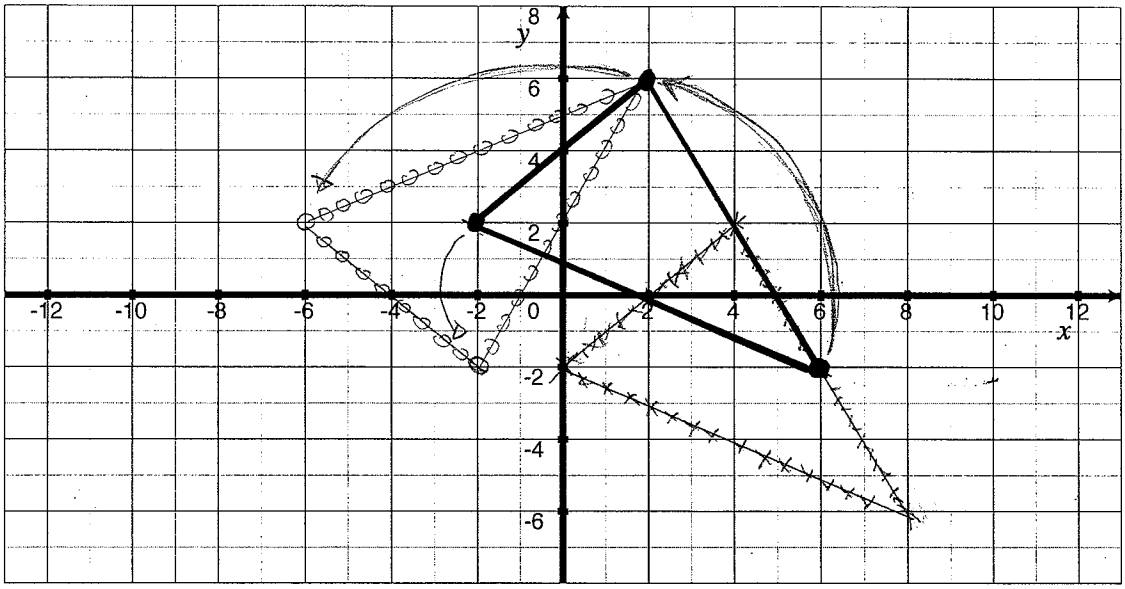
all 5 regular polyhedra shown on pg 617 are convex

Part B: Show *all* your work on the following. A right answer with no supporting work will receive no credit.

1. [4] Recall that an Euler circuit is a circuit that is traversable by a path that begins and ends at the same vertex. Can a network with two odd vertices be an Euler circuit? (There maybe as many even vertices as you like, but there must be exactly two odd vertices.) *Explain why or why not.* If it can be built, show an example below.

No. If a network is traversable we know (from the worksheet in class) that all vertices that are not at the beginning or end of the path (traversing the network), have an even number of arcs meeting at them. This means only the vertex at the beginning or end of the traversing path can be odd, but in an Euler circuit, the beginning & ending vertices are the same. Immidiatly this implies there can be at most one odd vertex in an Euler circuit. However, since the vertex must have the same number of 'exit' arcs as 'entrance' arcs, we find this beginning/end vertex must also be even.

2. [1] Plot a triangle whose vertices are $(-2, 2)$, $(2, 6)$, and $(6, -2)$ on the graph below.



(a) [2] Draw the image of the above polygon under the translation:

$$(x, y) \to (x + 2, y - 4).$$

(b) [2] Draw the image of the above triangle under the rotation about the origin by 90°.