

Name: Key

Quiz Score: /20

My final project is about things and stuff. Please let me know if you have any concerns regarding your project on the back.

1. Mark as true or false the following statements.

A) T F Projections always preserve distances between points.

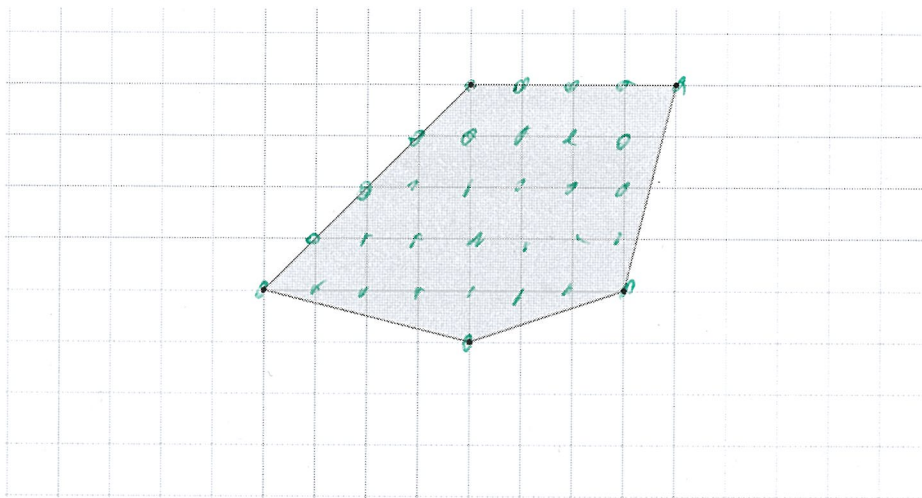
B) T F If two planes intersect at a line, then the angle formed between the two planes, called the dihedral angle, is constant along the line.

C) T F There exists a polytope in \mathbb{R}^3 that has 20 vertices, 10 edges, and 10 faces. $20 - 10 + 10 \neq 2$

D) T F Using Pick's theorem, we can compute the volume of a three dimensional sphere.

X X

2. Given the figure below, use Pick's formula to compute the area.



$B = 11$

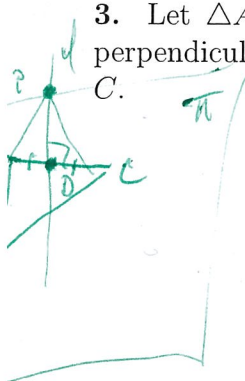
$I = 21$

$Area = 21 + \frac{11}{2} - 1$

$= 26 + \frac{1}{2} - 1$

$= 25.5$

3. Let $\triangle ABC$ be in a plane π . Call the point D the midpoint of \overline{BC} . Let the line ℓ be the line perpendicular to π through the point D . Show that any point P on ℓ is equidistant from the points B and C .



In the plane $\pi_2 = \pi(P, \overleftrightarrow{BC})$ line \overleftrightarrow{PD} is the perpendicular bisector of \overline{BC} which we know to have this property.

To prove it, let P be any point on ℓ , then $\triangle BDP \cong \triangle CDP$ by SAS where $\overline{BD} \cong \overline{DC}$, $\angle PDC \cong \angle PDB$, and $\overline{PD} \cong \overline{PD}$. Thus $PB = PC$.

□