

Name: _____

MAT 397

Fall 2020

Spacial Geometry T/F

“Geometry enlightens the intellect and sets one’s mind right. All of its proofs are very clear and orderly. It is hardly possible for errors to enter into geometrical reasoning, because it is well arranged and orderly. Thus, the mind that constantly applies itself to geometry is not likely to fall into error. In this convenient way, the person who knows geometry acquires intelligence.”

–Ibn Khaldun, 1332–1406

Mark the following statements as True (T) or False (F).

- (a) _____: If parallel lines lie in two distinct planes, the planes must be parallel.
- (b) _____: All planes intersect.
- (c) _____: Two planes can intersect at a point.
- (d) _____: Two planes can intersect at a line.
- (e) _____: Three planes can intersect at a point.
- (f) _____: Three planes can intersect at a line.
- (g) _____: If two lines in space are not parallel, then they must intersect.
- (h) _____: If lines are perpendicular to the same plane, they are parallel.
- (i) _____: If a line is perpendicular to a line in a plane, then it is perpendicular to the plane.
- (j) _____: If a line is perpendicular to one of two parallel planes, then it is perpendicular to the other.
- (k) _____: If a line is perpendicular to a plane, then it is perpendicular to all lines in the plane.
- (l) _____: If separate planes contain skew lines, the planes are parallel.
- (m) _____: The union of two planes is an angle.
- (n) _____: Two intersecting lines can lie in more than one plane.
- (o) _____: Two parallel lines determine a plane.
- (p) _____: Two skew lines determine a plane.
- (q) _____: Any three points determine a plane.
- (r) _____: If three lines are parallel, then they must be coplanar.
- (s) _____: In a plane, if two lines are perpendicular to the same line, they are parallel.
- (t) _____: In space, if two lines are perpendicular to the same line, they are parallel.

Solutions:

(a) F

(b) F

(c) F

(d) T

(e) T

(f) T

(g) F

(h) T

(i) F

(j) T

(k) F

(l) F

(m) F

(n) F

(o) T

(p) F

(q) F

(r) F

(s) T

(t) F