

Name: \_\_\_\_\_

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Quiz 2      MAC-2313

Fall 2018

1. (3 pts) Match the following equations with the appropriate surface:

(i)  $x^2 - 2y^2 - 3z^2 = 1$

(ii)  $x^2 - 2y^2 - 3z^2 = 0$

(iii)  $(x + 1)^2 + 2(y - 1)^2 + 3(z - 2)^2 = 10$

(iv)  $x - 2y^2 - 3z^2 = 1$

(v)  $(x + 1)^2 + 2(y - 1)^2 - 3(z - 2)^2 = 10.$

(vi)  $x^2 + 3z^2 = 1$

(a) elliptic cylinder

(b) hyperboloid with one sheet

(c) hyperboloid with two sheets

(d) elliptic cone

(e) elliptic paraboloid

(f) ellipsoid

2. (8 pts) For both parts of this problem, consider the line  $L$  given by  $x = 1 - 6t$ ,  $y = 3 + 5t$ ,  $z = 2 + 4t$ , and the plane  $\pi$  given by  $x + 2y - z = 1$ .

(a) (4 pts) Determine if the line  $L$  intersects the plane  $\pi$ , is parallel to the plane  $\pi$ , or is contained in the plane  $\pi$ . Justify your answer.

(b) (4 pts) Find the equation of a plane  $\tilde{\pi}$  which contains the given line  $L$  and is perpendicular to the given plane  $\pi$ .