

**Time Limit:** 5 minutes

**Instructions:** Closed book. Closed notes. No calculator allowed.

Instructions for all quizzes: **Do not discuss any aspect of this quiz with other midshipmen until after 6th period.**

Print your last name above. Also, fill in the bubble for your section.

Fill the bubble for the correct answer. Also, write your answers in any blanks provided.

Your work will not be graded unless requested.

Each equation defines a **surface in three dimensions**.

Identify each surface by writing the **best** capital letter in the blank.

A capital letter may be used more than once or not at all.

- |                         |                             |
|-------------------------|-----------------------------|
| (A) plane               | (I) hyperboloid of 1 sheet  |
| (B) sphere              | (J) hyperboloid of 2 sheets |
| (C) ellipsoid           | (K) hyperbolic paraboloid   |
| (D) paraboloid          | (L) parabolic cylinder      |
| (E) cone                | (M) circular cylinder       |
| (F) two parallel planes | (N) two intersecting planes |
| (G) hemisphere          | (O) half of an ellipsoid    |
| (H) one nappe of a cone | (P) half of a paraboloid    |

D  $y = x^2 + z^2$

K  $z = x^2 - y^2$

M  $x^2 + y^2 = 12$

J  $x^2 - y^2 - z^2 = 12$

J  $x^2 + y^2 - z^2 = -12$

multiply by  $-1$  to get  $-x^2 - 4y^2 + z^2 = 12$

O  $z = \sqrt{1 - x^2 - 4y^2}$

$z^2 = 1 - x^2 - 4y^2$ ;  $x^2 + 4y^2 + z^2 = 1$  (ellipsoid)

L  $y = z^2$

one variable is missing

A  $z = 4$

A  $(x + y - z)^2 = 0$

$x + y - z = 0$  (plane)

A  $\langle 1, 2, 4 \rangle \cdot \langle x, y, z \rangle = 12$

$x + 2y + 4z = 12$  (plane)