

Name: _____

Date: _____

Test Prep — Naming Game and Old Exam Pages — Chapter 12

Participation:

- +1: show your TA one homework solution from 12.5(2) or 12.5(3)
- +1: show your work on this first page

Important:

- Only this first page is part of the official test prep (naming shapes).
- The goal today is to ask lots of questions about 12.5 and 12.6 homework.
- Once you are comfortable with homework, try the exam problems on the other pages (or take them home).
- The remaining pages are **not** required to finish. The idea is to get you to start to check your understanding and see if you are ready for the exam.

Part 1 — Naming Game

Who can give the precise names of the following surfaces? (and name the traces? candy bonus for drawing one of the surfaces or giving an example of a curve on one of the surfaces.)

(All of these come directly from old exams)

• **Spring 2011 Exam 1:** $z = x^2 + 2y^2$ Name: _____

• **Spring 2017 Exam 1:** $x^2 + z^2 = 16 + y^2$ Name: _____

• **Spring 2018 Exam 1:** $4x^2 = 5y^2 + z$ Name: _____

• **Winter 2008 Exam 1:** $2x^2 = 10 - 3z^2$ Name: _____

• **Winter 2024 Exam 1:**

Find and simplify an equation for the surface consisting of all points (x, y, z) that are equidistant from the point $(0, 0, 2)$ and the xy -plane.

Equation: _____

Name: _____

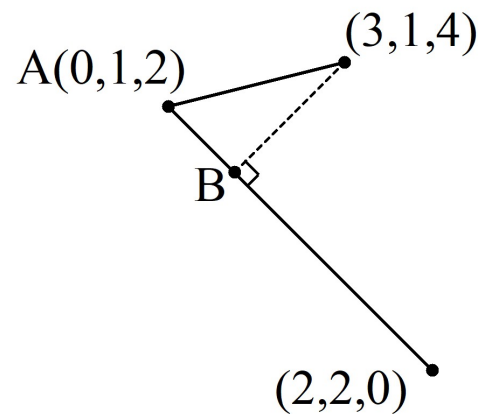
Part 2 — Old Exam Pages Please switch to homework questions on 12.5/12.6 now, but if you are good with homework, then check out these pages directly from old exams. *Would you know how to start these if they were on your test next week?*

Spring 2018 — Exam 1 (Pages 1–2)

1. (13 pts)

(a) Find a vector that has length 7 and is orthogonal to both $\mathbf{u} = \langle 1, 0, 2 \rangle$ and $\mathbf{v} = \langle 3, -2, 1 \rangle$

(b) Find the distance from point A to point B in the picture below



(c) Consider the line through the points $(0, 0, 1)$ and $(3, 4, 5)$.

Find the (x, y, z) point(s) where the line intersects the cylinder $x^2 + y^2 = 4$.

2. (12 pts)

(a) Find parametric equations for the line of intersection of the planes $x + y + z = 10$ and $x - 3y - 4z = -10$.

(b) Consider the plane that passes through $(4, 4, 2)$ and contains the line $x = 5t$, $y = 3 + t$, $z = 4 - t$. Find the (x, y, z) point where this plane intersects the y -axis.

Spring 2024 — Exam 1 (Page 2)

Students told me this was a challenging page — can you do it?

2. (12 pts)

(a) Determine whether each statement is true or false in \mathbb{R}^3 .

- i. TRUE FALSE: Two different lines parallel to a given plane must be parallel.
- ii. TRUE FALSE: Two different planes orthogonal to a given line must be parallel.

(b) Consider the line L_1 given by $x = 9 + t$, $y = 4 + 2t$, $z = 1 - 5t$.

A second line L_2 is perpendicular to the plane $3x - y + 5z = 30$ and intersects this plane at its z -intercept.

Give parametric equations for L_2 and find the intersection of L_1 and L_2 (or write DNE).

Line Equations for L_2 : _____

Intersection: $(x, y, z) =$ _____

(c) Find the equation of the plane that passes through $(3, 2, 1)$ and contains the line of intersection of the planes $2x + y + 5z = 9$ and $x - y + z = 3$.

Plane Equation: _____