

İzmir Institute of Technology
MATH 111 Analytic Geometry - Midterm I

Name: _____
Student ID: _____
Signature: _____

Duration: 90 Minutes

This exam contains 7 sheets (please check), including this sheet. You should write a few sentences for each question explaining the key points of your solutions.

Grade Table

Question:	1	2	3	4	5	6	7	Total
Points:	15	15	10	15	15	15	15	100
Score:								

1. (15 points) Show that $(1, 7)$ is on the perpendicular bisector of the segment AB where

$$A = (-2, 2) \quad \text{and} \quad B = (6, 4).$$

2. (15 points) Find the point P between A and B such that AB is divided in the given ratio.

$$A = (3, -2), \quad B = (8, 12), \quad \frac{\overline{AP}}{\overline{PB}} = \frac{2}{5}.$$

3. (10 points) If the line through $(-3, 9)$ and $(2, y)$ is perpendicular to one through $(-3, 9)$ and $(x, -1)$, find a relationship between x and y .

4. (15 points) Determine the value of a so that the given conditions are satisfied.

$$\mathbf{u} = 2\mathbf{i} - 4\mathbf{j}, \quad \mathbf{v} = 3\mathbf{i} + a\mathbf{j}, \quad \text{the angle between } \mathbf{u} \text{ and } \mathbf{v} \text{ is } \frac{\pi}{3}.$$

5. (15 points) Water freezes at 0°C , or 32°F , it boils at 100°C , or 212°F . The relation between the temperature in degrees centigrade C and in degrees Fahrenheit F is linear, find that relation.

6. (15 points) For what value(s) of m is the line $y = mx + 12$ at a distance 6 from the origin?

7. (15 points) Find an equation of the parabola with focus $(-2, 4)$ and directrix $y = 6$.