

Exam 1 – Practice 2

Exam Guidelines This is an in-class, written exam with a 75-minute time limit.

- **Permitted Materials:** You may use a basic calculator and a formula sheet.
- **Formula Sheet Restrictions:** Your sheet must contain **formulas only**; no examples or worked problems are permitted. All sheets will be inspected at the start of the exam.
- **Prohibited Items:** Phones and all other smart devices are strictly forbidden.
- **Academic Integrity:** The use of AI is prohibited. Any AI usage will result in an automatic F for the exam and may lead to failing the entire course.

1. Graph the below line.

a. $y = -2x + 3$

b. $y = -3$

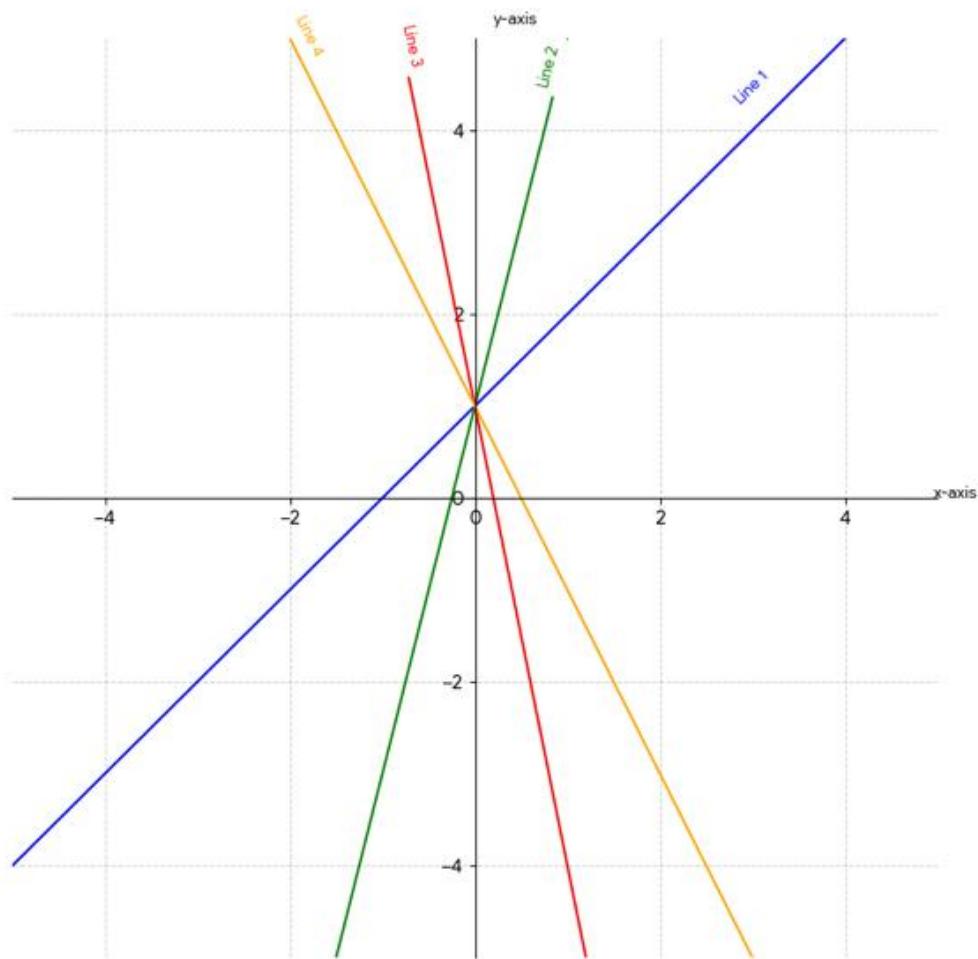
c. $x = -2$

2. Write the equation of the line

a. passing through two points $(1, 0)$ and $(2, -3)$

b. with the slope of 3 and passing through $(1, -2)$

3. Match each equation to its corresponding graph.



a. $y = x + 1$

- b. $y = -5x + 1$
 - c. $y = 4x + 1$
 - d. $y = -2x + 1$

4. You operate a small farmers' market stand that sells fresh organic honey. Market research shows that you can sell 200 jars per month if the price is \$6 per jar, but sales drop to 80 jars per month if the price is raised to \$14 per jar. On the supply side, local beekeepers are willing to supply 60 jars per month when the price is \$5 per jar, but they will increase production to 180 jars per month if the price rises to \$13 per jar.

a. Write the linear demand function and the linear supply function.

5. A company that manufactures custom hoodies has fixed monthly costs of \$75,000 and variable costs of \$40 per hoodie produced. Each hoodie sells for \$110.

- a. Find the cost function.
- b. Find the revenue function.
- c. Graph and clearly label the cost and revenue functions on the same set of axes. Identify and label the break-even point.
- d. Find the profit function.
- e. How much profit will the company make by producing and selling 2,000 hoodies?
- f. How many hoodies must be produced and sold in order to obtain a profit of \$75,000?

6. Two investment options that earn simple interest are available.

Investment A starts with **\$1,500** and earns **simple interest at an annual rate of 3%**.
Investment B starts with **\$2,400** and earns **simple interest at an annual rate of 1.5%**.

- a. Write a **linear equation** that represents the total amount of money in each investment after t years.
- b. How much money will there be in **Investment A** after 4 years?
- c. When will **Investment A** reach **\$1,860**?
- d. Determine which investment **grows faster** and explain your answer by comparing the **slopes** of the two equations.
- e. Determine whether the two investments will ever have the **same total value**. If so, find when this occurs.

f. Plot both investment functions on the same coordinate system.