

**Exam 1 – Practice 1**

1. Graph the below line.

a.  $y = 2x + 1$

b.  $y = 5$

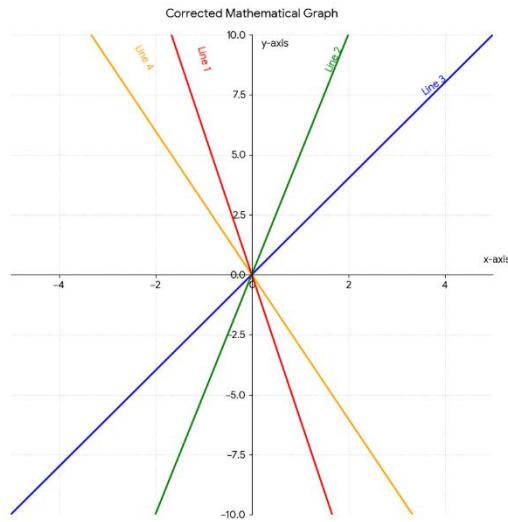
c.  $x = 3$

2. Write the equation of the line

a. passing through two points  $(1, 2)$  and  $(4, 3)$

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

3. Match the equations and their associated graphs.



- a.  $y = 2x$
  - b.  $y = 5x$
  - c.  $y = -3x$
  - d.  $y = -6x$
4. You manage a local craft shop that sells handmade artisan coffee mugs. Market research indicates that you can sell 150 mugs per month if they are priced at \$10 each, but you will only sell 50 mugs per month if the price is increased to \$20 each. On the other side, your supplier is willing to provide 30 mugs per month if the retail price is \$8 each but will increase production to 130 mugs per month if the retail price reaches \$18 each.
- a. Write the linear demand and supply functions.

- b. Find the equilibrium point. At what price must the mugs be sold for supply to exactly equal demand?
- c. Graph both the demand and supply functions on the same axis.
5. A company that prints custom T-shirts has fixed monthly costs of \$60,000 and variable costs of \$30 per T-shirt produced. Each T-shirt sells for \$90.
- 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 1,500 T-shirts?

f. How many T-shirts must be produced and sold in order to obtain a profit of \$60,000?

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

Investment A starts with \$1,200 and earns simple interest at an annual rate of 4%.  
Investment B starts with \$2,000 and earns simple interest at an annual rate of 2%.

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 in 3 years?
- c. When will investment A reaches \$1488?
- 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.