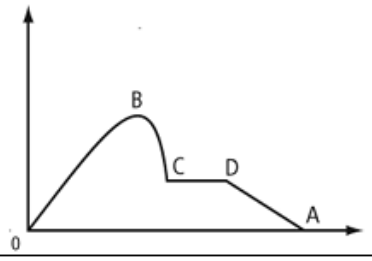
Name: _____ **Total:** /25

Relations and Functions Assignment

Multiple Choice (15 marks):
Identify the choice that best completes the statement or answers the question.

Use the following information to answer the next question.

The graph shows how the speed of a skier changes over time as she goes down the slope of a mountain.



____ **1.** Which statement describes what is happening to the skier as she moves from point C to point D on the graph?
- **a.** The skier is slowing down and has stopped.
- **b.** The skier is travelling at a constant speed.
- **c.** The skier has reached her maximum speed.
- **d.** The skier is increasing speed at a constant rate.

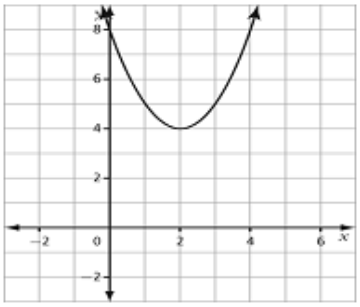
____ **2.** Which scenario can be represented by a discrete relation?
- **a.** the acceleration a person experiences on the way down a water slide
- **b.** the distance travelled by a car travelling at a constant speed
- **c.** the population changes of your school over a 5-year period
- **d.** the speed of a sky-diver from the time the diver jumps out of a plane to when the diver lands on the ground

____ **3.** What is the domain of the relation {(3,8), (5,9), (7, 6), (9, 2)}?
- **a.** $\{x|x \in \mathrm{R}\}$
- **b.** {2, 6, 8, 9}
- **c.** {3, 5, 7, 9}
- **d.** $\{x|x > 3, x \in \mathrm{R}\}$

____ **4.** Which of the following represents the range of the relation {(0,4), (1,5), (2,6), (3,7)}?
- **a.** $\{y|y > 3, x \in \mathrm{N}\}$
- **b.** $\{x|x \in \mathrm{N}\}$
- **c.** $\{y|4 \le y \le 7, y \in \mathrm{N}\}$
- **d.** $\{y|y \in \mathrm{N}\}$

____ **5.** Which statement describes the domain $\{x|1 < x < 3, x \in \mathrm{R}\}$ in interval notation?
- **a.** [1, 3]
- **b.** [1, 3)
- **c.** (1, 3]
- **d.** (1, 3)

____ **6.** State the range, in interval notation, of the following graph



a. $(-\infty, 4)$

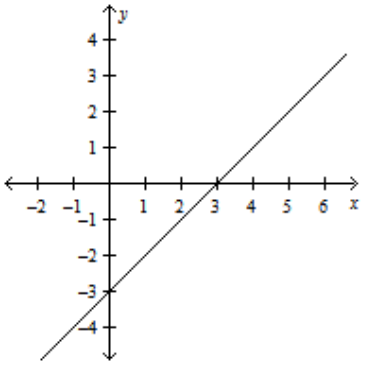
b. $(-\infty, 4]$

c. $(4, \infty)$

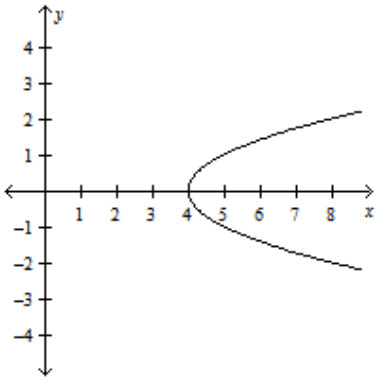
d. $[4, \infty)$

____ **7.** Which graph represents a relation that is *not* a function?

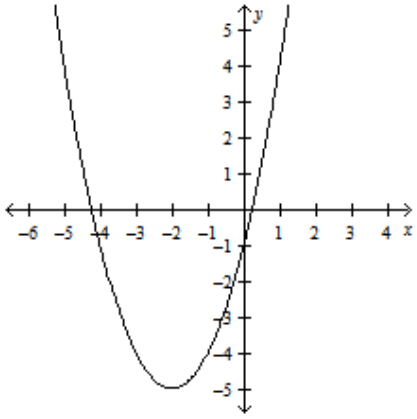
a.



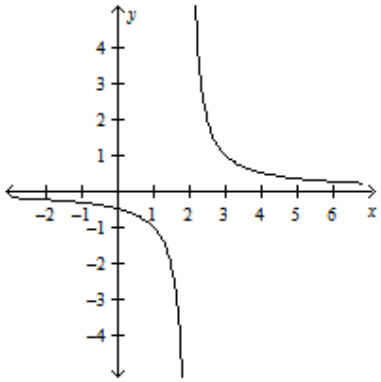
b.



c.



d.



____ **8.** Choose the set of ordered pairs that is a function.

a. {(0, 1), (1, 0), (0, –1), (–1, 2)}
b. {(1, 4), (2, 8), (3, 8), (4, 12)}
c. {(4, 7), (3, 5), (2, 8), (2, 3)}
d. {(5, –4), (5, 4), (4, –5), (–4, 5)}

____ **9.** Given the equation $f(x) = –6x – 2$, determine $f(4)$.

a. −26
b. −24
c. −22
d. 26

____ **10.** Evaluate $f(–2)$ for the function $f(x) = 4x^2 – x + 5$.

a. −13
b. −9
c. 19
d. 23

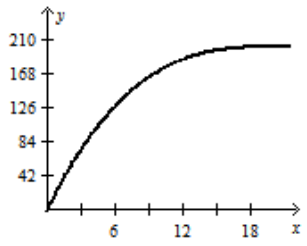
____ **11.** Given the equation $f(x) = 3x – 5$, determine $f(x) = -14$.

a. –3
b. 9
c. -19
d. 6

____ **12.** Which of the following statements is false?

a. The dependent variable is represented on the vertical axis of a Cartesian plane.
b. The independent variable is represented by the first coordinate of an ordered pair.
c. The outputs of a relation are shown on the horizontal axis of a Cartesian plane.
d. The independent variable is usually shown on the right side of an equation.

____ **13.** The graph below represents the flight of a plane traveling from Edmonton to Regina, a distance of 700 km. What does each axis represent?



a. The x-axis represents distance and the y-axis represents time.
b. The x-axis represents speed and the y-axis represents time.
c. The x-axis represents time and the y-axis represents distance.
d. The x-axis represents time and the y-axis represents speed.

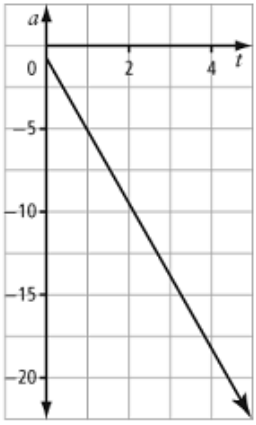
____ **14.** The table represents a linear function. What is the missing value?

x	y
3	−5
4	−9
5	?
6	−17
7	−21
8	−25

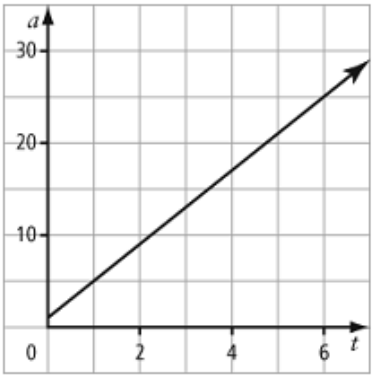
a. −11
b. −13
c. −15
d. −17

____ **15.** A plane gains altitude at an average rate of 5 m/s. Identify which graph represents this rate of change.

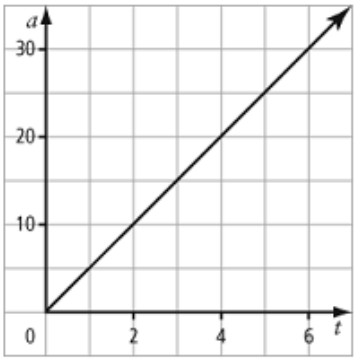
a.



c.



b.



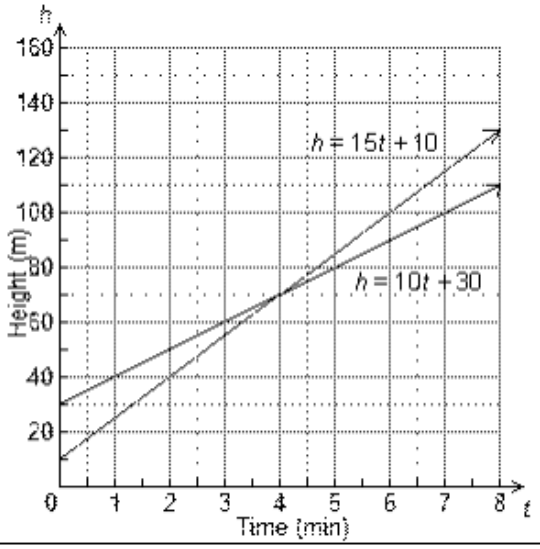
d.

Numeric Response (3 marks):

Use the following information to answer the next three questions.

Alex and Kendall are each flying their own hot air balloon. At time 0 min, Alex's balloon is closer to the ground than Kendall's balloon is. The graph represents the height, in metres, of each balloon after t minutes.

Height of Hot Air Balloons



1. The initial height (*h-intercept)* of Alex's balloon is _____.

   (Record your answer in the numerical response box from left to right.)

2. The initial height (*h-intercept)* of Kendall 's balloon is _____.

   (Record your answer in the numerical response box from left to right.)

3. The time when the two balloons are at the same height is _____.

   (Record your answer in the numerical response box from left to right.)

Problem (7 marks):

1. An amount of $1000 is deposited in a savings account and earns simple interest. The table shows the amount of money in the account at the end of each year.

Year	Amount ($)
0	1000
1	1100
2	1200
3	1300

a) State the independent and dependent variables. (1 mark)

b) Determine the rate of change. (1 mark)

c) Let t represent the Years, and A represent the amount in the account. Using your answer in part (b), write an equation in *function notation* that represents the data in the table. (1 mark)

2. Given the function, $f(x) = -4x - 5$, evaluate $f(10)$. (1 mark)

3. Given the function $g(x) = 0.2x + 15$, determine the value of x when $g(x) = 15$. (1 mark)

4. Given the function $f(x) = 4x - 8$, determine the *x-intercept* and *y-intercept*. (1 mark)

Use these two points to graph this function. Label and number the axes. (1 mark)