Functions Quiz 1

November, 2021

1 Name and Date:

Print your name and todays date below;

Name	Date

Question 1 (1)**.** Answer the following True/False questions,

1. The two fundamental properties of sets are,
   - Duplicate elements are not allowed.
   - Order matters.

   Circle the correct answer: **True** **False**
2. Let $S = \{3, 4, 5, 2, 1, 3, 0\}$, then $(-3 + 4 - 5 + 2 - 1 + 3) \in S$.
   Circle the correct answer: **True** **False**
3. $\sqrt{4} \in \mathbb{Z}$.
   Circle the correct answer: **True** **False**
4. The vertex of
   $$f(x) = 3(x + 4)^2 + 1$$
   is (4,1).
   Circle the correct answer: **True** **False**
5. The centre of the circle,
   $$(x + 1)^2 + (y + 2)^2 = 4$$
   is $(-1, -2)$.
   Circle the correct answer: **True** **False**
6. The vertex of,
   $$f(x) = -\frac{5}{3}(x - 3)^2 - 4.$$
   represents a minimum.
   Circle the correct answer: **True** **False**
7. The y-intercept of,
   $$f(x) = -x^2 + 3x + 4.$$
   is -4.
   Circle the correct answer: **True** **False**

Question 2 (2)**.** Write down the elements of the following sets. (Remember to use dots (. . .) where applicable)

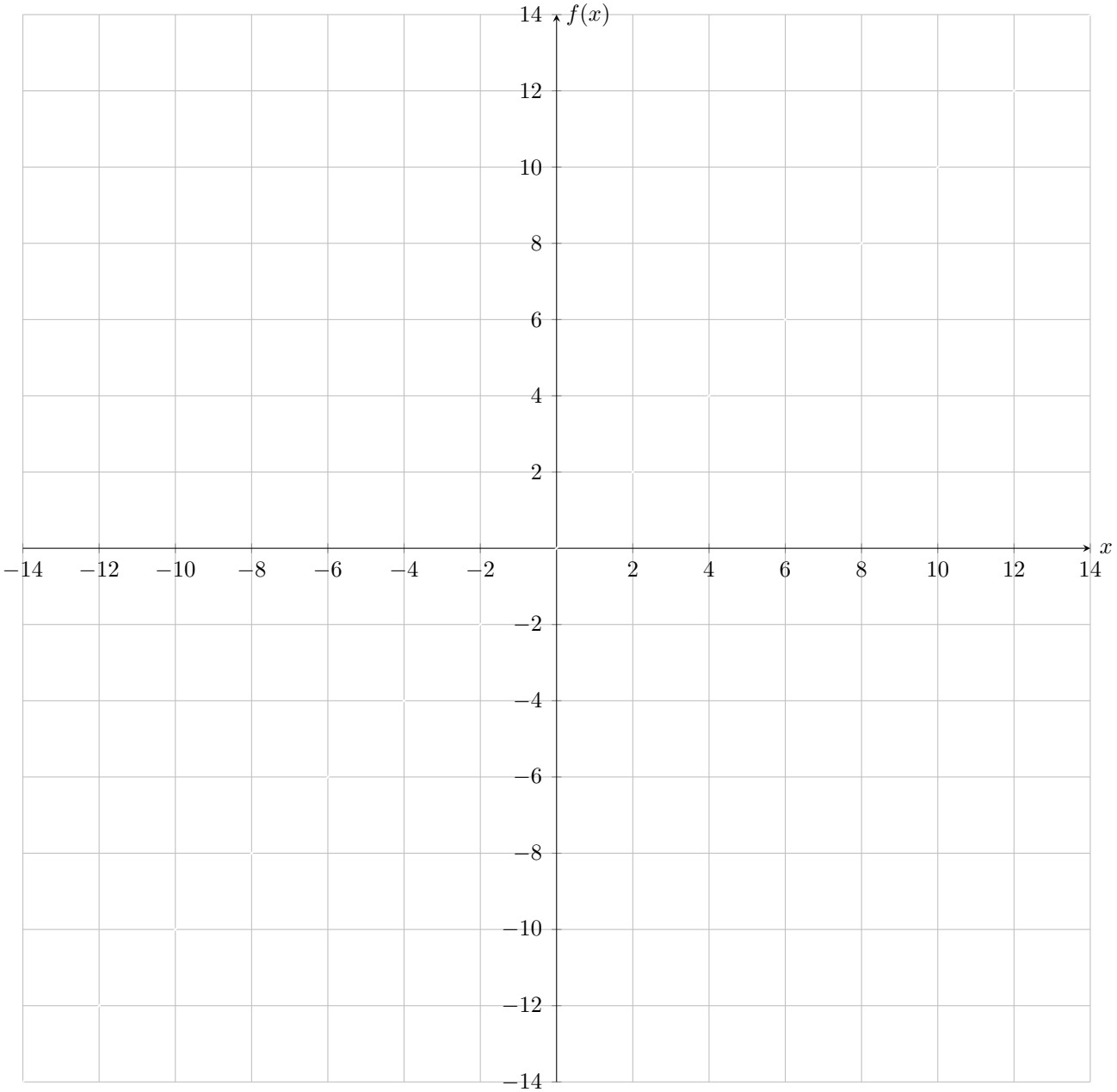
(a) $A = \{t \in \mathbb{Z} \mid 0 \leq t < 5\}$

(b) $R = \{r \in \mathbb{Z} \mid r \geq 1\}$

(c) $T = \{x \in \mathbb{Z} \mid x^2 = 1\}$

Question 3 (3)**.** Graph the following circle,

$$(x-6)^2 + (y+8)^2 = 36.$$



Question 4 (4)**.** Lets define the following function,

$$f : \mathbb{R} \to \mathbb{R}$$
$$f(x) = -x^2 + 2x + 8$$

(a) Complete the square to convert f into vertex form.

(b) Sketch the function using your answer from part (a)
(**NOTE:** Make sure you label the y-intercept as well as the vertex).