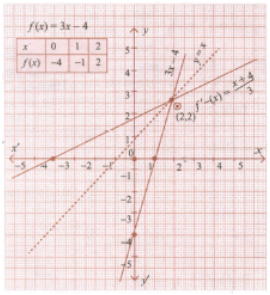
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Answers Key:

III. Answer the following.

1. Given f(x) = 3x - 4
   Let y = 3x - 4 ⇒ y + 4 = 3x
   $\Rightarrow x = \frac{y+4}{3}$
   Let g(y) = $\frac{y+4}{3}$
   Now gof(n) = g(f(n)) = g(3× -4) = $\frac{3x-4+4}{3} = \frac{3x}{3} = x$
   and fog(y) = f(g(y)) = $f\left(\frac{y+4}{4}\right) = 3\left(\frac{y+4}{3}\right) - 4 = y + 4 - 4 = y$
   Thus, gof(x) = I_x and fog (y) = I_y
   This implies that f and g are bijections and inverses to each other
   Hence f is bijection and $f^{-1}(x) = \frac{y+4}{3}$
   Replacing y by x, we get f^{-1} (x) = $\frac{x+4}{3}$



   Hence, the graph of y = f^{-1}(x) is the reflection of the graph of f in y = x
2. f(-4) = +4 + 4 [∴ f(x) = -x + 4 when x = -4]
   =8
   f(1) = 1-1^2 [∴ f(x) = x-x^2 when x = 1]
   f(1) = 0
   f(-2) = $(-2)^2$-(-2) [∴ f(x) = x^2-x when x = -2]
   = 4+2 = 6
   f(7) = 0 [∴ f(x) = 0 when x = 7]
   f(0 = 0^2-0 [∴ f(x) = x^2 - x when x = 0]
   =0
   ∴ f(-4) = 8, f(1) = 0, f(-2) = 6, f(7) = 0 and f(0) = 1
3. The relation is defined by aRb if a + b ≤ 6 for all a, b ∈N.
   a+b ≤6 ⇒ a ≤ 6 - b

a	5	4	3	2	1
b	1	2	3	4	5

   ∴ The list of ordered pairs are (5, 1) (4, 2) (3, 3) (2, 4) and (1, 5).
   Reflexivity: R is not reflexive since (5, 5) ∉ R.

II. Answer the following.

4. Given cost of one meal = Rs. 100
   Number of customers is given by the function D(x) = 200 - x
   ∴ Day cost function = (200 - x)(100)
   = 20000 - 100x
5. We have $A \cap B' \cap C' \subseteq A \subseteq A \cup B' \cup C$ and hence $(A \cup B' \cup C) \cap (A \cap B' \cap C') = A \cap B' \cap C'$
   Also, $B' \cap C' \subseteq C' \subseteq A \cup B \cup C'$ and hence $(A \cup B \cup C') \cap B' \cap C' = B' \cap C'$
   Now as $A \cap B' \cap C' \subseteq B' \cap C'$,
   We have $((A \cup B' \cup C) \cap (A \cap B' \cap C')) \cup ((A \cup B \cup C') \cap (B' \cap C')) = B' \cap C'$

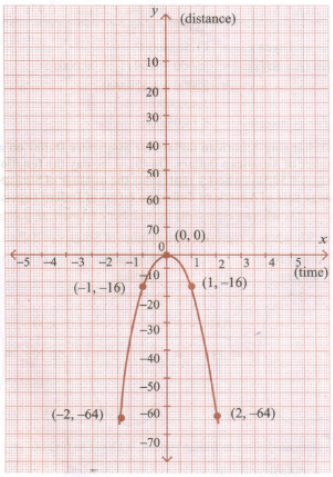
I. Answer the following.

6. Since A× A contains 16 elements, then A must have 4 elements
   ⇒ n(A) = 4.
   The elements of A × A are (1, 3) and (0, 2)
   ∴ The possibilities of elements of A are {0, 1, 2, 3}
7. Given s(t) = -16t^2
   Now, s(t_1) = s(t_2) ⇒ $-16t_1^2 = -16t_2^2$
   ⇒ t_1^2 = t_2^2
   ⇒ ± t_1 = ± t_2
   Since s(t_1) = s(t_2) ≠ t_1 = t_2, the function s(t) is not one-one.

Graph of $s(t) = -16t^2$

Let X-axis represents the time and Y-axis represents the distance.

t	0	1	-1	2	-2
s(t)	0	-16	-16	-64	-64



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