

(الف) $t_1 = r(1)^2 - 1 = 2, t_2 = r(2)^2 - 1 = 11, t_3 = r(3)^2 - 1 = 24, t_4 = r(4)^2 - 1 = 47$
 $t_5 = r(5)^2 - 1 = 74 \Rightarrow \boxed{2, 11, 24, 47, 74}$ ✓

(ب) $t_1 = \frac{r(1)+1}{1+4} = \frac{r}{5}, t_2 = \frac{r(2)+1}{2+4} = \frac{r}{6}, t_3 = \frac{r(3)+1}{3+4} = 1, t_4 = \frac{r(4)+1}{4+4} = \frac{r}{8}$
 $t_5 = \frac{r(5)+1}{5+4} = \frac{11}{9} \Rightarrow \boxed{\frac{r}{5}, \frac{r}{6}, 1, \frac{r}{8}, \frac{11}{9}}$ ✓ (۲)

(الف) $t_{1r} = \frac{(-1)^{1r}}{\sqrt{1r+3}} = -\frac{1}{r} \Rightarrow \boxed{t_{1r} = -\frac{1}{r}}$ ✓

(ب) $t_{1r} = r(1r) - \left[\frac{1r}{r}\right] = 24 - [2, 25] = 24 - 3 = 21$ ✓ (۲)

(الف) $t_n < r_n < 10, t_1 = r(1) - 10 = -8, t_2 = r(2) - 10 = -6, t_3 = r(3) - 10 = -4, t_4 = r(4) - 10 = -2$
 $t_5 = r(5) - 10 = 0 \Rightarrow \boxed{t_5 = 0 = t_1, t_2, t_3, t_4}$ ✓

(ب) $t_n < 4, n = \frac{14 \pm \sqrt{196 - 140}}{2} = \frac{14 \pm 4}{2} \Rightarrow n_1 = 9, n_2 = 10 \Rightarrow 9 < n < 10$

$n = 5, 6, 7, 8, 9 \Rightarrow \boxed{t_5 = 0 = t_6, t_7, t_8, t_9}$ ✓ (۲)

(الف) $t_n \leq 0, r_n \leq 14, t_n = r(n) - 14 = 0 \Rightarrow \boxed{t_8 = 0 = t_1, t_2, \dots, t_7}$ ✓

(ب) $t_n \leq 0, n = \frac{12 \pm \sqrt{144 - 108}}{2} = \frac{12 \pm 4}{2} \Rightarrow n_1 = 3, n_2 = 9, 3 \leq n \leq 9$

$\Rightarrow \boxed{t_3 = 0 = t_4, \dots, t_9}$ ✓ (۲)

$$t_8 = 8a + b = 7 \quad t_9 = 9a + b = 22$$

$$(9a + b) - (8a + b) = 22 - 7 \Rightarrow a = 15, \quad 8(15) + b = 7 \Rightarrow b = -119 \Rightarrow t_n = 15n - 119$$

$$t_2 = 2(15) - 119 = 30 - 119 = -89 \quad \boxed{-89} \quad \checkmark \quad (2)$$

$$n = -\frac{r}{r(1)} = 3 \quad t_3 = 3^2 - 4(3) + 2 = 9 - 12 + 2 = -1 \Rightarrow \boxed{t_3 = -1} \quad \checkmark$$

$$n = -2 \quad n = 1 \quad \boxed{t_1 = 1 + 8 + 1 = 10} \rightarrow \text{دو جمله} \quad \checkmark \quad (2)$$

$$t_2 = 8 + 8 + 1 = 17 \Rightarrow \text{برای تریس}$$

$$1, -4, -7, -10, -13, \dots$$

$$-4 - 1 = -5, -7 - (-4) = -3, -10 - (-7) = -3, -13 - (-10) = -3$$

$$+2, +2, +2, +2$$

$$a = \frac{d}{r} \Rightarrow a = 1$$

$$x^2 + bx + 1 \Rightarrow 1 + b + 1 = -4 \Rightarrow b = -6$$

$$x^2 - 6x + 1 \Rightarrow 1^2 - 6(1) + 1 = -4 \quad \boxed{-4} \quad \checkmark$$

$$-7, -4, -1, 2, 5, \dots$$

$$-4 - (-7) = 3, -1 - (-4) = 3, 2 - (-1) = 3, 5 - 2 = 3$$

$$+1, +3, +5, +7$$

$$a = \frac{d}{r} \Rightarrow a = 2$$

$$2x^2 + bx - 7 \Rightarrow 2 + b - 7 = -4 \Rightarrow b = 1$$

$$\boxed{2x^2 + x - 7} \quad \checkmark$$

(1)

$$a + 4 = 2a + 1$$

$$1) \quad \boxed{a = 3} \quad \text{اشتراک با ۳}$$

$$a > 3 \leftarrow 2a + 1 > a + 4 \leftarrow \text{اشتراک با ۳}$$

$$\textcircled{1} \cap \textcircled{2} \rightarrow a \geq 3$$

$$(n-1) \times 3 = 94 \quad n-1 = 31 \quad \boxed{n = 32}$$

(الف) ۳۳ ✓

$$(n-1) \times 5 = 95 \quad n-1 = 19 \Rightarrow \boxed{n = 20}$$

(ب) ۲۰ ✓

$$(n-1) \times 15 = 75 \quad n-1 = 5 \Rightarrow \boxed{n = 6}$$

(ج) ۶ ✓

$$33 + 20 - 6 = 47 \quad \boxed{47} \quad \checkmark$$

(د) ۴۷ ✓