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حل تمرینات ریاضی دهم ریاضی طبیعی ۱۳

①

$a_1 = ٤٠$

$a_٤ = a_1 + ٣d = ٦١$

$٤٠ + ٣d = ٦١$

$٣d = ٢١$

$d = ٧$

$t_n = ٧n + ٣٣$

$t_n = ٧n + ٣٣ = ٢٠٨$

$٧n = ١٧٥$

$n = ٢٥$

②

$١٠١ \leq x \leq ٩٩٧$

$t_n = ٧n + ٩٤$

$t_n = ٧n + ٩٤ = ٩٩٧$

$n = ١٢٩$

③

$٣a + (n + n+١ + n+٢)d = -٦n + ١٢$

$٣a + ٣nd + ٣d = -٦n + ١٢$

$٣nd = -٦n$, $d = -٢$

$٣a + ٣d = ١٢$

$٣a - ٦ = ١٢$

$a = ٦$

$d = -٢$

$a = ٦$

$a_٨ + a_{١٧} = ٢a + (٧ + ١٦)d = ٢ \times ٦ + ٢٣ \times -٢ = ١٢ - ٤٦ = -٣٤$

④

$a_٨ - a_٣ = ٥d = ٢^{x+١} - ٢^x + ١ = ٢^x(٢-١) + ١ = ٢^x + ١$

$a_{١٣} - a_٨ = ٥d = ٢^{٢x} - ٣ - ٢^{x+١} = ٢^x(٢^x - ٢^١) - ٣$

$٢^x + ١ = ٢^x(٢^x - ٢) - ٣$

$٤ = ٢^{٢x} - ٢^{x+١} - ٢^x \Rightarrow ٤ = ٢^x(٢^x - ٢ - ١)$

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$٤ = ٢^n(٢^n - ٣) \Rightarrow ٤ = ٢^{٢n} - ٣\times٢^n$

$٢ = n$

$٢^٢ - ١ = ٣$

$٢^{٢+١} = ٨$

$٢^٤ - ٣ = ١٣$

$\xrightarrow{+}$ ٢٤

٥ ⑤

~~$a_{١٠} - a_{١٢} = ٥$~~ $a_{١٢} - a_{١٠} = ٥ \Rightarrow ٢d = ٥ \Rightarrow d = ٢/٥$

$a_{١٠} + a_{١٢} = ٢٥ \Rightarrow ٢a_١ + ٢٠d = ٢٥ \quad a_١ = -١٢/٥$

$a_{٢١} = a_{١٢} + ٩d =$

~~$٢a_{١٠} = ٢٠$~~

$١٠ - ٢٢/٥ = -١٢/٥$

~~$a_{١٠} = ١٥$~~

$a_{٢١} = a_١ + ٢٠d$

~~$a_{١٢} = ١٠ \Rightarrow ٢d + a_{١٠} = ١٠$~~

$-١٢/٥ + ٢٠(٢/٥) = ٣٧/٥$

$٢d = -٥$

$d = -٢/٥$

⑥

$\frac{٩}{٢}(٢a + ٤d) = \frac{١}{٢}\times\frac{٩}{٢}(٢a + ١٤d)$ ⑦

$٩a + ١٢d = ٢a + ١٤d$

$٢a = ٢d$

$٢a = d$

$\frac{a_٢}{a_١} = \frac{a + d}{a} = \frac{٣a}{a} = ٣$

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(٧) $(t_9+t_5)(t_9-t_5) = (t_{v+1}rd - t_{v+r}d)(t_{v+1}rd + t_{v+r}d)$

$$\frac{(rt_v)(fd)}{t_v} = \frac{rt_v \times r_0}{t_v} = \boxed{r_0}$$

$$rd = 10 \Rightarrow t_n - t_{n-r} = 10$$
$$d = 0$$

(٨) $$d = \frac{r+\sqrt{r}-r(1-9\sqrt{r})}{11} = \frac{r+\sqrt{r}-r+11r\sqrt{r}}{11} = \frac{11r\sqrt{r}}{11} = \boxed{\sqrt{r}}$$

(٩) $$d = \frac{rr-r}{en-r} = \frac{r_0}{en-r} = \frac{10}{rn-1}$$

$$t_{n+1} = a + nd = r + \frac{10}{rn-1} \times n = 11$$

$$\frac{10n}{rn-1} = 9 \Rightarrow 10n = 1An - 9$$
$$9 = rn$$
$$\boxed{r = n}$$

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$$a_n + a_{n+4} = a_2 + a_{17}$$

$$n + n + 4 = 2 + 17$$

$$2n + 4 = 20$$

$$2n = 16$$

$$n = 8$$

$$a_8 + a_{12} = a_4 + a_{17}$$

$$a_8 = 2a_4 \Rightarrow a + 7d = 2a + 9d$$

$$0 = 2a + 2d$$

$$0 = a + d \Rightarrow \boxed{a_2 = 0}$$