

۱) $d_{10} = d_{1r^9} = \frac{1}{r^9} \times r^9 = 1$ ✓ ۱/۵

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$d_{1r^9} = 1$ $d_{1r^9} = 1$ $d_{10} = d_{1r^9} = 1 \times r^9 = 1 \times r^9 = r^9$ ✓

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$1-x$ x $x+1$ $x^2 = (1-x)(x+1) = 1 - x^2$ ✓

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$(1-x)^2 = 1 - 2x + x^2$ ✓

$\Rightarrow d + b = 5 \Rightarrow \frac{5}{2} = 2.5 \Rightarrow d + b = 2.5 \Rightarrow c = 2.5$ ✓

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$$d_1 + d_2 = 2A = d_1 + d_1 r^2 = d_1(1 + r^2) \quad r = 3 \quad 2d_1 + d_1 = 2A$$

$$d_2 + d_3 = 12 = d_1 r + d_1 r^2 = d_1 r(1 + r) \quad d_1 \times 3 \quad 3d_1 = 12 \Rightarrow d_1 = 4$$

$$\frac{2A}{12} = \frac{d_1(1+r^2)}{d_1 r(1+r)} = \frac{r^2+1}{r(r+1)} = \frac{(r+1)(r^2+1-r)}{r(r+1)} = \frac{r^2+1-r}{r} \rightarrow 2Ar = 12r^2 - 12r$$

$$12r^2 - 12r + 12 - 2Ar = 0$$

$$12r^2 - 12r + 12 = 0$$

$$r - 12r + 12 = 0 \quad (r-3)(r-4) = 0 \quad r_1 = 3 \quad r_2 = 4 \rightarrow d_1 = 4$$

$$d_1 + d_2 + d_3 = 12 \quad d_1 + d_1 r + d_1 r^2 = 12 \quad r = 3 \rightarrow d_1 = \frac{12}{1+3+9} = 1$$

$$d_1 \times d_2 \times d_3 = 27 \quad d_1(1+r+r^2) = 12 \quad d_1 = 1 \quad d_2 = 3 \quad d_3 = 9$$

$$d_2^2 = 27 \Rightarrow d_2 = 3 \quad \frac{12}{r}(1+r+r^2) = 12 \quad r = \frac{1}{3} \rightarrow d_1 = 9 \quad d_2 = 3 \quad d_3 = 1$$

$$d_1 = \frac{d_2}{r} = \frac{3}{3} = 1$$

$$1 + 3 + 9 = 12$$

$$1 \times 3 \times 9 = 27$$

$$d_n = 2, 4, 16 \quad S_0 \Rightarrow d_1(r^n - 1) = 2(16 - 1) = 2 \times 15 = 30$$

$$d_{10} = d_1 r^9 = 2 \times 2^9 = 1024$$

$$\sqrt{(d_1 \cdot d_n)^n} = \sqrt{(2 \times 1024)^n} = \sqrt{(2 \times 2^{10})^n} = \sqrt{2^{20n}} = 2^{10n}$$

$$d_1, d_2, d_3, \dots, d_n$$

$$d_1, d_1 r, d_1 r^2, \dots, d_1 r^{n-1}$$

$$d_1 r - d_1 = d_1(r-1) \quad d_1 r^2 - d_1 r = d_1 r(r-1) \rightarrow d_1 r^2(r-1)$$

$$d_1 r^3 - d_1 r^2 = d_1 r^2(r-1) \rightarrow d_1 r^2(r-1)$$

$$d_1(r-1) \rightarrow d_1 r^2(r-1)$$

$$9 = \frac{d_1 r^n}{d_1 r} \rightarrow \frac{d_1 r^9}{d_1 r} = 9 \checkmark$$

$$S_n = \frac{n}{2} (2d + (n-1)d) \quad d_1, d_2, d_3, \dots, d_n$$

$$S_n = d_1 + d_1 d + d_1 d^2 + \dots + d_1 d^{n-1}$$

$$r S_n = n (r d + (n-1)d) \Rightarrow S_n = \frac{n}{2} (r d + (n-1)d)$$

$$S_n = d_1 + d_1 r + d_1 r^2 + \dots + d_1 r^{n-1}$$

$$r S_n = d_1 r + d_1 r^2 + d_1 r^3 + \dots + d_1 r^n$$

$$S_n - r S_n = d_1 - d_1 r^n$$

$$(1-r) S_n = d_1(1-r^n)$$

$$S_n = \frac{d_1(1-r^n)}{1-r}$$

$$9 S_n = d_1 r + d_1 r^2 + d_1 r^3 + \dots + d_1 r^n$$