Explicit Formula

Unit 6: Representations of Linear Relations

Find the explicit formula.

1. 4, −196, −396, −596, ...

$-196-(4) = -200$
$-396-(-196) = -200$
$-596-(-396) = -200$

$a_n = d \cdot n + b$
$4 = -200(1) + b$
$4 = -200 + b$
$+200 \quad +200$
$204 = b$

$a_n = -200n + 204$

2. −24, −32, −40, −48, ...

$-32-(-24) = -8$
$-40-(-32) = -8$
$-48-(-40) = -8$

$a_n = d \cdot n + b$
$-24 = -8(1) + b$
$-24 = -8 + b$
$+8 \quad +8$
$-16 = b$

$a_n = -8n - 16$

3. 17, 12, 7, 2, ...

$12-(17) = -5$
$7-(12) = -5$
$2-(7) = -5$

$a_n = d \cdot n + b$
$17 = -5(1) + b$
$17 = -5 + b$
$+5 \quad +5$
$22 = b$

$a_n = -5n + 22$

4. 7, 14, 21, 28, ...

$14-(7) = 7$
$21-(14) = 7$
$28-(21) = 7$

$a_n = d \cdot n + b$
$7 = 7(1) + b$
$7 = 7 + b$
$-7 \quad -7$
$0 = b$

$a_n = 7n + 0$ OR $a_n = 7n$

5. 19, 39, 59, 79, ...

$39-(19) = 20$
$59-(39) = 20$
$79-(59) = 20$

$a_n = d \cdot n + b$
$19 = 20(1) + b$
$19 = 20 + b$
$-20 \quad -20$
$-1 = b$

$a_n = 20n - 1$

6. −31, −26, −21, −16, ...

$-26-(-31) = 5$
$-21-(-26) = 5$
$-16-(-21) = 5$

$a_n = d \cdot n + b$
$-31 = 5(1) + b$
$-31 = 5 + b$
$-5 \quad -5$
$-36 = b$

$a_n = 5n - 36$

7. −4, −12, −20, −28, ...

$-12-(-4) = -8$
$-20-(-12) = -8$
$-28-(-20) = -8$

$a_n = d \cdot n + b$
$-4 = -8(1) + b$
$-4 = -8 + b$
$+8 \quad +8$
$4 = b$

$a_n = -8n + 4$

8. 7, −3, −13, −23, ...

$-3-(7) = -10$
$-13-(-3) = -10$
$-23-(-13) = -10$

$a_n = d \cdot n + b$
$7 = -10(1) + b$
$7 = -10 + b$
$+10 \quad +10$
$17 = b$

$a_n = -10n + 17$

9. −30, −38, −46, −54, ...

$-38-(-30) = -8$
$-46-(-38) = -8$
$-54-(-46) = -8$

$a_n = d \cdot n + b$
$-30 = -8(1) + b$
$-30 = -8 + b$
$+8 \quad +8$
$-22 = b$

$a_n = -8n - 22$

10. −2, −5, −8, −11, ...

$-5-(-2) = -3$
$-8-(-5) = -3$
$-11-(-8) = -3$

$a_n = d \cdot n + b$
$-2 = -3(1) + b$
$-2 = -3 + b$
$+3 \quad +3$
$1 = b$

$a_n = -3n + 1$

11. $-3, -23, -43, -63, \ldots$

$-23-(-3) = -20$
$-43-(-23) = -20$
$-63-(-43) = -20$

$a_n = d \cdot n + b$
$-3 = -20(1) + b$
$-3 = -20 + b$
$+20 \quad +20$
$17 = b$

$a_n = -20n + 17$

12. $-21, -121, -221, -321, \ldots$

$-121-(-21) = -100$
$-221-(-121) = -100$
$-321-(-221) = -100$

$a_n = d \cdot n + b$
$-21 = -100(1) + b$
$-21 = -100 + b$
$+100 \quad +100$
$79 = b$

$a_n = -100n + 79$

13. $24, 21, 18, 15, \ldots$

$21-(24) = -3$
$18-(21) = -3$
$15-(18) = -3$

$a_n = d \cdot n + b$
$24 = -3(1) + b$
$24 = -3 + b$
$+3 \quad +3$
$27 = b$

$a_n = -3n + 27$

14. $15, 17, 19, 21, \ldots$

$17-(15) = 2$
$19-(17) = 2$
$21-(19) = 2$

$a_n = d \cdot n + b$
$15 = 2(1) + b$
$15 = 2 + b$
$-2 \quad -2$
$13 = b$

$a_n = 2n + 13$

15. $22, 12, 2, -8, \ldots$

$12-(22) = -10$
$2-(12) = -10$
$-8-(2) = -10$

$a_n = d \cdot n + b$
$22 = -10(1) + b$
$22 = -10 + b$
$+10 \quad +10$
$32 = b$

$a_n = -10n + 32$

16. $40, 70, 100, 130, \ldots$

$70-(40) = 30$
$100-(70) = 30$
$130-(100) = 30$

$a_n = d \cdot n + b$
$40 = 30(1) + b$
$40 = 30 + b$
$-30 \quad -30$
$10 = b$

$a_n = 30n + 10$

17. $38, 238, 438, 638, \ldots$

$238-(38) = 200$
$438-(238) = 200$
$638-(438) = 200$

$a_n = d \cdot n + b$
$38 = 200(1) + b$
$38 = 200 + b$
$-200 \quad -200$
$-162 = b$

$a_n = 200n - 162$

18. $10, 40, 70, 100, \ldots$

$40-(10) = 30$
$70-(40) = 30$
$100-(70) = 30$

$a_n = d \cdot n + b$
$10 = 30(1) + b$
$10 = 30 + b$
$-30 \quad -30$
$-20 = b$

$a_n = 30n - 20$

19. $8, -2, -12, -22, \ldots$

$-2-(8) = -10$
$-12-(-2) = -10$
$-22-(-12) = -10$

$a_n = d \cdot n + b$
$8 = -10(1) + b$
$8 = -10 + b$
$+10 \quad +10$
$18 = b$

$a_n = -10n + 18$

20. $-31, -38, -45, -52, \ldots$

$-38-(-31) = -7$
$-45-(-38) = -7$
$-52-(-45) = -7$

$a_n = d \cdot n + b$
$-31 = -7(1) + b$
$-31 = -7 + b$
$+7 \quad +7$
$-24 = b$

$a_n = -7n - 24$