

Unit 6: Representations of Linear Relations
POST TEST – Version A

Determine if the sequence is arithmetic. If it is, find the common difference.

<p>1. 14, 10, 6, 2, ...</p> $10 - (14) = -4$ $6 - (10) = -4$ $2 - (6) = -4$ <p>Arithmetic $d = -4$</p>	<p>2. -5, -10, -15, -20, ...</p> $-10 - (-5) = -5$ $-15 - (-10) = -5$ $-20 - (-15) = -5$ <p>Arithmetic $d = -5$</p>
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Find the recursive formula for each of the following:

<p>3. -23, -27, -31, -35, ...</p> $d = -27 - (-23) = -4$ $a_n = a_{n-1} + d$ $a_n = a_{n-1} - 4$ <p>$a_1 = -23$</p>	<p>4. -32, -42, -52, -62, ...</p> $d = -42 - (-32) = -10$ $a_n = a_{n-1} + d$ $a_n = a_{n-1} - 10$ <p>$a_1 = -32$</p>
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Find the explicit formula for each of the following:

<p>5. -10, -6, -2, 2, ...</p> $d = -6 - (-10) = 4$ $a_n = d \cdot n + b$ $-10 = 4(1) + b$ $-10 = 4 + b$ $-4 - 4 = b$ $-14 = b$ $a_n = 4n - 14$	<p>6. 27, 30, 33, 36, ...</p> $d = 30 - (27) = 3$ $a_n = d \cdot n + b$ $27 = 3(1) + b$ $27 = 3 + b$ $-3 - 3 = b$ $24 = b$ $a_n = 3n + 24$
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Given the following arithmetic sequences answer each of the following:

<p>7. 11, 9, 7, 5, ...</p> <p>A. Find the next three terms</p> $9 - (11) = -2$ $7 - (9) = -2$ $5 - (7) = -2$ $a_5 = 5 - 2 = 3$ $a_6 = 3 - 2 = 1$ $a_7 = 1 - 2 = -1$	<p>B. Find a_{26}</p> $a_n = n \cdot d + b$ $11 = 1(-2) + b$ $11 = -2 + b$ $+2 \quad +2$ $13 = b$ $a_n = -2n + 13$ $a_{26} = -2(26) + 13$ $a_{26} = -52 + 13$ $a_{26} = -39$	<p>C. Find a_{52}</p> $a_n = -2n + 13$ $a_{52} = -2(52) + 13$ $a_{52} = -104 + 13$ $a_{52} = -91$
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8. 1, 3, 5, 7, ...

<p>A. Find the next three terms</p> $3 - (1) = 2$ $5 - (3) = 2$ $7 - (5) = 2$ $a_5 = 7 + 2 = 9$ $a_6 = 9 + 2 = 11$ $a_7 = 11 + 2 = 13$	<p>B. Find a_{25}</p> $a_n = n \cdot d + b$ $1 = 1(2) + b$ $1 = 2 + b$ $-2 \quad -2$ $-1 = b$ $a_n = 2n - 1$ $a_{25} = 2(25) - 1$ $a_{25} = 50 - 1$ $a_{25} = 49$	<p>C. Find a_{52}</p> $a_n = 2n - 1$ $a_{52} = 2(52) - 1$ $a_{52} = 104 - 1$ $a_{52} = 103$
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Find the missing term or terms in each arithmetic sequence.

9. ..., -1, __, 17, ... $a_2 = 8$	10. ..., 19, __, 27, ... $a_2 = 23$
11. ..., 19, __, __, 79, ... $a_2 = 39$ $a_3 = 59$	12. ..., 2, __, __, 302, ... $a_2 = 102$ $a_3 = 202$
13. ..., 39, __, __, __, 47, ... $a_2 = 41$ $a_3 = 43$ $a_4 = 45$	14. ..., 37, __, __, __, 57, ... $a_2 = 42$ $a_3 = 47$ $a_4 = 52$
15. ..., -34, __, __, __, -134, ... $a_2 = -54$ $a_3 = -74$ $a_4 = -94$ $a_5 = -114$	16. ..., 13, __, __, __, 63, ... $a_2 = 23$ $a_3 = 33$ $a_4 = 43$ $a_5 = 53$
17. ..., 39, __, __, __, __, 219, ... $a_2 = 69$ $a_3 = 99$ $a_4 = 129$ $a_5 = 159$ $a_6 = 189$	18. ..., 35, __, __, __, __, 5, ... $a_2 = 30$ $a_3 = 25$ $a_4 = 20$ $a_5 = 15$ $a_6 = 10$

Evaluate the related series of each sequence.

19. 22, 26, 30, 34, 38, 42, 46 $22 + 26 + 30 + 34 + 38 + 42 + 46 = 238$	20. 14, 23, 32, 41, 50, 59 $14 + 23 + 32 + 41 + 50 + 59 = 219$
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Evaluate each arithmetic series described.

21. $8 + 12 + 16 + 20 \dots, n = 13$ $d = 12 - 8 = 4$ $S_{13} = \frac{13}{2} (2 \cdot 8 + (13-1) \cdot 4)$ $n = 13$ $= 6.5 (16 + 48)$ $a_1 = 8$ $= 6.5 (64)$ $= 416$	22. $(-19) + (-26) + (-33) + (-40) \dots, n = 13$ $d = -26 - (-19) = -7$ $S_{13} = \frac{13}{2} (2 \cdot (-19) + (13-1) \cdot (-7))$ $n = 13$ $= 6.5 (-38 + 12(-7))$ $a_1 = -19$ $= 6.5 (-38 + (-84))$ $= 6.5 (-122) = -793$
23. $\sum_{k=1}^{10} (4k - 3)$ $S_{10} = \frac{10}{2} (2 \cdot 1 + (10-1) \cdot 4)$ $d = 4$ $= 5 (2 + 36)$ $n = 10$ $= 5 (38)$ $a_1 = 4(1) - 3$ $= 190$ $a_1 = 1$	24. $\sum_{n=1}^6 (4n - 14)$ $S_6 = \frac{6}{2} (2 \cdot 10 + (6-1) \cdot 4)$ $d = 4$ $= 3 (-20 + 20)$ $n = 6$ $= 3(0)$ $a_1 = 4(1) - 14$ $= 0$ $a_1 = -10$
25. $a_1 = 10, d = 2, n = 11$ $S_{11} = \frac{11}{2} (2 \cdot 10 + (11-1) \cdot 2)$ $S_{11} = 5.5 (20 + 20)$ $S_{11} = 5.5 (40) = 220$	26. $a_1 = 0, d = 8, n = 9$ $S_9 = \frac{9}{2} (2 \cdot 0 + (9-1) \cdot 8)$ $= 4.5 (0 + 64)$ $= 288$

$$\textcircled{9} \dots, \underset{a_1}{-1}, \underset{a_2}{\quad}, \underset{a_3}{17}, \dots$$

$$a_2 = -1 + 9 = \boxed{8}$$

$$a_n = a_1 + (n-1) \cdot d$$

$$17 = -1 + (3-1) \cdot d$$

$$17 = -1 + 2d$$

$$\begin{array}{r} +1 \quad +1 \\ \hline \frac{18}{2} = \frac{2d}{2} \\ 9 = d \end{array}$$

$$\textcircled{10} \dots, \underset{a_1}{19}, \underset{a_2}{\quad}, \underset{a_3}{27}, \dots$$

$$a_2 = 19 + 4 = \boxed{23}$$

$$a_n = a_1 + (n-1) \cdot d$$

$$27 = 19 + (3-1) \cdot d$$

$$27 = 19 + 2d$$

$$\begin{array}{r} -19 \quad -19 \\ \hline \frac{8}{2} = \frac{2d}{2} \\ 4 = d \end{array}$$

$$\textcircled{11} \dots, \underset{a_1}{19}, \underset{a_2}{\quad}, \underset{a_3}{\quad}, \underset{a_4}{79}, \dots$$

$$a_2 = 19 + 20 = \boxed{39}$$

$$a_3 = 39 + 20 = \boxed{59}$$

$$a_n = a_1 + (n-1) \cdot d$$

$$79 = 19 + (4-1) \cdot d$$

$$79 = 19 + 3d$$

$$\begin{array}{r} -19 \quad -19 \\ \hline \frac{60}{3} = \frac{3d}{3} \\ 20 = d \end{array}$$

$$\textcircled{12} \dots, \underset{a_1}{2}, \underset{a_2}{\quad}, \underset{a_3}{\quad}, \underset{a_4}{302}, \dots$$

$$a_2 = 2 + 100 = \boxed{102}$$

$$a_3 = 102 + 100 = \boxed{202}$$

$$a_n = a_1 + (n-1) \cdot d$$

$$302 = 2 + (4-1) \cdot d$$

$$302 = 2 + 3d$$

$$\begin{array}{r} -2 \quad -2 \\ \hline \frac{300}{3} = \frac{3d}{3} \\ 100 = d \end{array}$$

$$\textcircled{13} \dots, \underset{a_1}{39}, \underset{a_2}{\quad}, \underset{a_3}{\quad}, \underset{a_4}{\quad}, \underset{a_5}{47}, \dots$$

$$a_2 = 39 + 2 = \boxed{41}$$

$$a_3 = 41 + 2 = \boxed{43}$$

$$a_4 = 43 + 2 = \boxed{45}$$

$$a_n = a_1 + (n-1) \cdot d$$

$$47 = 39 + (5-1) \cdot d$$

$$47 = 39 + 4d$$

$$\begin{array}{r} -39 \quad -39 \\ \hline \frac{8}{4} = \frac{4d}{4} \\ 2 = d \end{array}$$

$$(14) \dots, 37, \underline{\quad}, \underline{\quad}, \underline{\quad}, 57, \dots$$

$$a_1 \quad a_2 \quad a_3 \quad a_4 \quad a_5$$

$$a_2 = 37 + 5 = \boxed{42}$$

$$a_3 = 42 + 5 = \boxed{47}$$

$$a_4 = 47 + 5 = \boxed{52}$$

$$a_n = a_1 + (n-1) \cdot d$$

$$57 = 37 + (5-1) \cdot d$$

$$57 = 37 + 4d$$

$$\begin{array}{r} -37 \quad -37 \\ \hline 20 = 4d \\ \frac{20}{4} = \frac{4d}{4} \\ 5 = d \end{array}$$

$$(15) \dots, -34, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, -134, \dots$$

$$a_1 \quad a_2 \quad a_3 \quad a_4 \quad a_5 \quad a_6$$

$$a_2 = -34 - 20 = \boxed{-54}$$

$$a_3 = -54 - 20 = \boxed{-74}$$

$$a_4 = -74 - 20 = \boxed{-94}$$

$$a_5 = -94 - 20 = \boxed{-114}$$

$$a_n = a_1 + (n-1) \cdot d$$

$$-134 = -34 + (6-1) \cdot d$$

$$-134 = -34 + 5d$$

$$\begin{array}{r} +34 \quad +34 \\ \hline -100 = 5d \\ \frac{-100}{5} = \frac{5d}{5} \\ -20 = d \end{array}$$

$$(16) \dots, 13, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, 63, \dots$$

$$a_1 \quad a_2 \quad a_3 \quad a_4 \quad a_5 \quad a_6$$

$$a_2 = 13 + 10 = \boxed{23}$$

$$a_3 = 23 + 10 = \boxed{33}$$

$$a_4 = 33 + 10 = \boxed{43}$$

$$a_5 = 43 + 10 = \boxed{53}$$

$$a_n = a_1 + (n-1) \cdot d$$

$$63 = 13 + (6-1)d$$

$$63 = 13 + 5d$$

$$\begin{array}{r} -13 \quad -13 \\ \hline 50 = 5d \\ \frac{50}{5} = \frac{5d}{5} \\ 10 = d \end{array}$$

$$(17) \dots, 39, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, 219, \dots$$

$$a_1 \quad a_2 \quad a_3 \quad a_4 \quad a_5 \quad a_6 \quad a_7$$

$$a_2 = 39 + 30 = \boxed{69}$$

$$a_3 = 69 + 30 = \boxed{99}$$

$$a_4 = 99 + 30 = \boxed{129}$$

$$a_5 = 129 + 30 = \boxed{159}$$

$$a_6 = 159 + 30 = \boxed{189}$$

$$a_n = a_1 + (n-1) \cdot d$$

$$219 = 39 + (7-1) \cdot d$$

$$219 = 39 + 6d$$

$$\begin{array}{r} -39 \quad -39 \\ \hline 180 = 6d \\ \frac{180}{6} = \frac{6d}{6} \\ 30 = d \end{array}$$

$$(18) \dots, 35, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, 5, \dots$$

$$a_1 \quad a_2 \quad a_3 \quad a_4 \quad a_5 \quad a_6 \quad a_7$$

$$a_2 = 35 - 5 = \boxed{30}$$

$$a_3 = 30 - 5 = \boxed{25}$$

$$a_4 = 25 - 5 = \boxed{20}$$

$$a_5 = 20 - 5 = \boxed{15}$$

$$a_6 = 15 - 5 = \boxed{10}$$

$$a_n = a_1 + (n-1) \cdot d$$

$$5 = 35 + (7-1) \cdot d$$

$$5 = 35 + 6d$$

$$\begin{array}{r} -35 \quad -35 \\ \hline -30 = 6d \\ \frac{-30}{6} = \frac{6d}{6} \\ -5 = d \end{array}$$

Unit 6: Representations of Linear Relations
POST TEST – Version B

Determine if the sequence is arithmetic. If it is, find the common difference.

<p>1. -26, -17, -8, 1, ...</p> $\begin{aligned} -17 - (-26) &= 9 \\ -8 - (-17) &= 9 \\ 1 - (-8) &= 9 \end{aligned}$ <p style="text-align: center;">Arithmetic $d = 9$</p>	<p>2. -14, -9, -4, 1, ...</p> $\begin{aligned} -9 - (-14) &= 5 \\ -4 - (-9) &= 5 \\ 1 - (-4) &= 5 \end{aligned}$ <p style="text-align: center;">Arithmetic $d = 5$</p>
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Find the recursive formula for each of the following:

<p>3. -18, -20, -22, -24, ...</p> $d = -20 - (-18) = -2$ <p>$a_1 = -18$ $a_n = a_{n-1} - 2$</p>	<p>4. -29, -39, -49, -59, ...</p> $d = -39 - (-29) = -10$ <p>$a_1 = -29$ $a_n = a_{n-1} - 10$</p>
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Find the explicit formula for each of the following:

<p>5. 24, 14, 4, -6, ...</p> $d = 14 - (24) = -10$ <p>$a_n = n \cdot d + b$ $24 = 1(-10) + b$ $24 = -10 + b$ $\frac{+10 \quad +10}{34 = b}$</p> <p>$a_n = -10n + 34$</p>	<p>6. 10, 16, 22, 28, ...</p> $d = 16 - (10) = 6$ <p>$a_n = n \cdot d + b$ $10 = 1(6) + b$ $10 = 6 + b$ $\frac{-6 \quad -6}{4 = b}$</p> <p>$a_n = 6n + 4$</p>
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Given the following arithmetic sequences answer each of the following:

7. 18, -182, -382, -582, ...

<p>A. Find the next three terms</p> $\begin{aligned} -182 - (18) &= -200 \\ -382 - (-182) &= -200 \\ -582 - (-382) &= -200 \end{aligned}$ $\begin{aligned} a_5 &= -582 - 200 = -782 \\ a_6 &= -782 - 200 = -982 \\ a_7 &= -982 - 200 = -1182 \end{aligned}$	<p>B. Find a_{38}</p> $a_n = n \cdot d + b$ $18 = 1(200) + b$ $18 = 200 + b$ $\frac{-200 \quad -200}{-182 = b}$ $a_n = -200n + 218$ $a_{38} = -200(38) + 218$ $a_{38} = -7600 + 218 = -7382$	<p>C. Find a_{52}</p> $a_n = -200n + 218$ $a_{52} = -200(52) + 218$ $a_{52} = -10400 + 218$ $a_{52} = -10182$
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8. 30, 33, 36, 39, ...

<p>A. Find the next three terms</p> $\begin{aligned} 33 - (30) &= 3 \\ 36 - (33) &= 3 \\ 39 - (36) &= 3 \end{aligned}$ $\begin{aligned} a_5 &= 39 + 3 = 42 \\ a_6 &= 42 + 3 = 45 \\ a_7 &= 45 + 3 = 48 \end{aligned}$	<p>B. Find a_{30}</p> $a_n = n \cdot d + b$ $30 = 1 \cdot 3 + b$ $30 = 3 + b$ $\frac{-3 \quad -3}{27 = b}$ $a_n = 3n + 27$ $a_{30} = 3(30) + 27$ $a_{30} = 90 + 27 = 117$	<p>C. Find a_{52}</p> $a_n = 3n + 27$ $a_{52} = 3(52) + 27$ $a_{52} = 156 + 27$ $a_{52} = 183$
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Find the missing term or terms in each arithmetic sequence.

9. ..., -13, ____, 187, ... $a_2 = 87$	10. ..., -8, ____, -4, ... $a_2 = -6$
11. ..., 4, ____, ____, -14, ... $a_2 = -2$ $a_3 = -8$	12. ..., 19, ____, ____, 43, ... $a_2 = 27$ $a_3 = 35$
13. ..., -35, ____, ____, ____, 5, ... $a_2 = -25$ $a_3 = -15$ $a_4 = -5$	14. ..., -36, ____, ____, ____, -76, ... $a_2 = -46$ $a_3 = -56$ $a_4 = -66$
15. ..., -39, ____, ____, ____, -54, ... $a_2 = -42$ $a_3 = -45$ $a_4 = -48$ $a_5 = -51$	16. ..., -36, ____, ____, ____, -1, ... $a_2 = -29$ $a_3 = -22$ $a_4 = -15$ $a_5 = -8$
17. ..., -40, ____, ____, ____, ____, -10, ... $a_2 = -35$ $a_3 = -30$ $a_4 = -25$ $a_5 = -20$ $a_6 = -15$	18. ..., 19, ____, ____, ____, ____, 7, ... $a_2 = 17$ $a_3 = 15$ $a_4 = 13$ $a_5 = 11$ $a_6 = 9$

Evaluate the related series of each sequence.

19. 20, 25, 30, 35 $20 + 25 + 30 + 35 = 110$	20. 18, 22, 26, 30 $18 + 22 + 26 + 30 = 96$
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Evaluate each arithmetic series described.

21. $(-5) + (-14) + (-23) + (-32) \dots, n = 10$ $d = -14 - (-5) = -9$ $S_{10} = \frac{10}{2} (2 \cdot (-5) + (10-1) \cdot (-9))$ $n = 10$ $S_{10} = 5(-10 + -81)$ $a_1 = -5$ $S_{10} = 5(-91)$ $S_{10} = -455$	22. $13 + 15 + 17 + 19 \dots, n = 13$ $d = 15 - 13 = 2$ $S_{13} = \frac{13}{2} (2 \cdot 13 + (13-1) \cdot 2)$ $n = 13$ $S_{13} = 6.5(26 + 24)$ $a_1 = 13$ $S_{13} = 6.5(50)$ $S_{13} = 325$
23. $\sum_{k=1}^{15} (3k - 8)$ $S_{15} = \frac{15}{2} (2 \cdot (-5) + (15-1) \cdot 3)$ $d = 3$ $S_{15} = 7.5(-10 + 42)$ $n = 15$ $S_{15} = 7.5(32)$ $a_1 = 3(1) - 8$ $S_{15} = 240$ $a_1 = -5$	24. $\sum_{i=1}^{35} (8i - 1)$ $S_{35} = \frac{35}{2} (2 \cdot 7 + (35-1) \cdot 8)$ $d = 8$ $S_{35} = 17.5(14 + 272)$ $n = 35$ $S_{35} = 17.5(286)$ $a_1 = 8(1) - 1$ $S_{35} = 5005$ $a_1 = 7$
25. $a_1 = 3, d = -6, n = 40$ $S_{40} = \frac{40}{2} (2 \cdot 3 + (40-1) \cdot (-6))$ $S_{40} = 20(6 - 234)$ $S_{40} = 20(-228) = -4560$	26. $a_1 = 13, d = 10, n = 14$ $S_{14} = \frac{14}{2} (2 \cdot 13 + (14-1) \cdot 10)$ $S_{14} = 7(26 + 130)$ $S_{14} = 7(156) = 1092$

$$\textcircled{9} \dots, -13, \underline{\quad}, 187, \dots$$

$a_1 \quad a_2 \quad a_3$

$$a_2 = -13 + 100 = \boxed{87}$$

$$a_n = a_1 + (n-1) \cdot d$$

$$187 = -13 + (3-1) \cdot d$$

$$187 = -13 + 2d$$

$$+13 \quad +13$$

$$\frac{200}{2} = \frac{2d}{2}$$

$$100 = d$$

$$\textcircled{10} \dots, -8, \underline{\quad}, -4, \dots$$

$a_1 \quad a_2 \quad a_3$

$$a_2 = -8 + 2 = \boxed{-6}$$

$$a_n = a_1 + (n-1) \cdot d$$

$$-4 = -8 + (3-1) \cdot d$$

$$-4 = -8 + 2d$$

$$+8 \quad +8$$

$$\frac{4}{2} = \frac{2d}{2}$$

$$2 = d$$

$$\textcircled{11} \dots, 4, \underline{\quad}, \underline{\quad}, -14, \dots$$

$a_1 \quad a_2 \quad a_3 \quad a_4$

$$a_2 = 4 - 6 = \boxed{-2}$$

$$a_3 = -2 - 6 = \boxed{-8}$$

$$a_n = a_1 + (n-1) \cdot d$$

$$-14 = 4 + (4-1) \cdot d$$

$$-14 = 4 + 3d$$

$$-4 \quad -4$$

$$\frac{-18}{3} = \frac{3d}{3}$$

$$-6 = d$$

$$\textcircled{12} \dots, 19, \underline{\quad}, \underline{\quad}, 43, \dots$$

$a_1 \quad a_2 \quad a_3 \quad a_4$

$$a_2 = 19 + 8 = \boxed{27}$$

$$a_3 = 27 + 8 = \boxed{35}$$

$$a_n = a_1 + (n-1) \cdot d$$

$$43 = 19 + (4-1) \cdot d$$

$$43 = 19 + 3d$$

$$-19 \quad -19$$

$$\frac{24}{3} = \frac{3d}{3}$$

$$8 = d$$

$$\textcircled{13} \dots, -35, \underline{\quad}, \underline{\quad}, \underline{\quad}, 5, \dots$$

$a_1 \quad a_2 \quad a_3 \quad a_4 \quad a_5$

$$a_2 = -35 + 10 = \boxed{-25}$$

$$a_3 = -25 + 10 = \boxed{-15}$$

$$a_4 = -15 + 10 = \boxed{-5}$$

$$a_n = a_1 + (n-1) \cdot d$$

$$5 = -35 + (5-1) \cdot d$$

$$5 = -35 + 4d$$

$$+35 \quad +35$$

$$\frac{40}{4} = \frac{4d}{4}$$

$$10 = d$$

$$\textcircled{14} \dots, -36, \underline{\quad}, \underline{\quad}, \underline{\quad}, -76, \dots$$

$$a_1 \quad a_2 \quad a_3 \quad a_4 \quad a_5$$

$$a_2 = -36 - 10 = \boxed{-46}$$

$$a_3 = -46 - 10 = \boxed{-56}$$

$$a_4 = -56 - 10 = \boxed{-66}$$

$$a_n = a_1 + (n-1) \cdot d$$

$$-76 = -36 + (5-1) \cdot d$$

$$-76 = -36 + 4d$$

$$+36 \quad +36$$

$$\frac{-40}{4} = \frac{4d}{4}$$

$$-10 = d$$

$$\textcircled{15} \dots, -39, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, -54, \dots$$

$$a_1 \quad a_2 \quad a_3 \quad a_4 \quad a_5 \quad a_6$$

$$a_2 = -39 - 3 = \boxed{-42}$$

$$a_4 = -45 - 3 = \boxed{-48}$$

$$a_3 = -42 - 3 = \boxed{-45}$$

$$a_5 = -48 - 3 = \boxed{-51}$$

$$a_n = a_1 + (n-1) \cdot d$$

$$-54 = -39 + (6-1) \cdot d$$

$$-54 = -39 + 5d$$

$$+39 \quad +39$$

$$\frac{-15}{5} = \frac{5d}{5}$$

$$-3 = d$$

$$\textcircled{16} \dots, -36, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, -1, \dots$$

$$a_1 \quad a_2 \quad a_3 \quad a_4 \quad a_5 \quad a_6$$

$$a_2 = -36 + 7 = \boxed{-29}$$

$$a_4 = -22 + 7 = \boxed{-15}$$

$$a_3 = -29 + 7 = \boxed{-22}$$

$$a_5 = -15 + 7 = \boxed{-8}$$

$$a_n = a_1 + (n-1) \cdot d$$

$$-1 = -36 + (6-1) \cdot d$$

$$-1 = -36 + 5d$$

$$+36 \quad +36$$

$$\frac{35}{5} = \frac{5d}{5}$$

$$7 = d$$

$$\textcircled{17} \dots, -40, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, -10, \dots$$

$$a_1 \quad a_2 \quad a_3 \quad a_4 \quad a_5 \quad a_6 \quad a_7$$

$$a_2 = -40 + 5 = \boxed{-35}$$

$$a_5 = -25 + 5 = \boxed{-20}$$

$$a_3 = -35 + 5 = \boxed{-30}$$

$$a_6 = -20 + 5 = \boxed{-15}$$

$$a_4 = -30 + 5 = \boxed{-25}$$

$$a_n = a_1 + (n-1) \cdot d$$

$$-10 = -40 + (7-1) \cdot d$$

$$-10 = -40 + 6d$$

$$+40 \quad +40$$

$$\frac{30}{6} = \frac{6d}{6}$$

$$5 = d$$

$$\textcircled{18} \dots, 19, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, 7, \dots$$

$$a_1 \quad a_2 \quad a_3 \quad a_4 \quad a_5 \quad a_6 \quad a_7$$

$$a_2 = 19 - 2 = \boxed{17}$$

$$a_5 = 13 - 2 = \boxed{11}$$

$$a_3 = 17 - 2 = \boxed{15}$$

$$a_6 = 11 - 2 = \boxed{9}$$

$$a_4 = 15 - 2 = \boxed{13}$$

$$a_n = a_1 + (n-1) \cdot d$$

$$7 = 19 + (7-1) \cdot d$$

$$7 = 19 + 6d$$

$$-19 \quad -19$$

$$\frac{-12}{6} = \frac{6d}{6}$$

$$-2 = d$$

Unit 6: Representations of Linear Relations
POST TEST – Version C

Determine if the sequence is arithmetic. If it is, find the common difference.

<p>1. $-4, -11, -18, -25, \dots$</p> <p>$-11 - (-4) = -7$ $-18 - (-11) = -7$ $-25 - (-18) = -7$</p> <p>Arithmetic $d = -7$</p>	<p>2. $-4, 96, 196, 296, \dots$</p> <p>$96 - (-4) = 100$ $196 - (96) = 100$ $296 - (196) = 100$</p> <p>Arithmetic $d = 100$</p>
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Find the recursive formula for each of the following:

<p>3. $-16, -12, -8, -4, \dots$</p> <p>$d = -12 - (-16) = 4$</p> <p>$a_1 = -16$ $a_n = a_{n-1} + 4$</p>	<p>4. $-1, 99, 199, 299, \dots$</p> <p>$d = 99 - (-1) = 100$</p> <p>$a_1 = -1$ $a_n = a_{n-1} + 100$</p>
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Find the explicit formula for each of the following:

<p>5. $-16, -10, -4, 2, \dots$</p> <p>$d = -10 - (-16) = 6$</p> <p>$a_n = n \cdot d + b$ $-16 = 1(6) + b$ $-16 = 6 + b$ $\frac{-6}{-6} \quad \frac{-6}{-6}$ $-22 = b$</p> <p>$a_n = 6n - 22$</p>	<p>6. $37, 237, 437, 637, \dots$</p> <p>$237 - (37) = 200$</p> <p>$a_n = n \cdot d + b$ $37 = 1(200) + b$ $37 = 200 + b$ $\frac{-200}{-200} \quad \frac{-200}{-200}$ $-163 = b$</p> <p>$a_n = 200n - 163$</p>
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Given the following arithmetic sequences answer each of the following:

7. $36, 66, 96, 126, \dots$

<p>A. Find the next three terms</p> <p>$66 - (36) = 30$ $96 - (66) = 30$ $126 - (96) = 30$</p> <p>$a_5 = 126 + 30 = 156$ $a_6 = 156 + 30 = 186$ $a_7 = 186 + 30 = 216$</p>	<p>B. Find a_{38}</p> <p>$a_n = n \cdot d + b$ $36 = 1(30) + b$ $36 = 30 + b$ $\frac{-30}{-30} \quad \frac{-30}{-30}$ $6 = b$</p> <p>$a_n = 30n + 6$ $a_{38} = 30(38) + 6$ $a_{38} = 1140 + 6$ $a_{38} = 1146$</p>	<p>C. Find a_{52}</p> <p>$a_n = 30n + 6$ $a_{52} = 30(52) + 6$ $a_{52} = 1560 + 6$ $a_{52} = 1566$</p>
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8. $23, 20, 17, 14, \dots$

<p>A. Find the next three terms</p> <p>$20 - (23) = -3$ $17 - (20) = -3$ $14 - (17) = -3$</p> <p>$a_5 = 14 - 3 = 11$ $a_6 = 11 - 3 = 8$ $a_7 = 8 - 3 = 5$</p>	<p>B. Find a_{30}</p> <p>$a_n = n \cdot d + b$ $23 = 1(-3) + b$ $23 = -3 + b$ $\frac{+3}{+3} \quad \frac{+3}{+3}$ $26 = b$</p> <p>$a_n = -3n + 26$ $a_{30} = -3(30) + 26$ $a_{30} = -90 + 26$ $a_{30} = -64$</p>	<p>C. Find a_{52}</p> <p>$a_n = -3n + 26$ $a_{52} = -3(52) + 26$ $a_{52} = -156 + 26$ $a_{52} = -130$</p>
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Find the missing term or terms in each arithmetic sequence.

9. ..., -16, ____, -36, ... $a_2 = -26$	10. ..., 4, ____, 18, ... $a_2 = 11$
11. ..., -23, ____, ____, -113, ... $a_2 = -53$ $a_3 = -83$	12. ..., 34, ____, ____, 334, ... $a_2 = 134$ $a_3 = 234$
13. ..., -30, ____, ____, ____, 10, ... $a_2 = -20$ $a_3 = -10$ $a_4 = 0$	14. ..., -27, ____, ____, ____, 9, ... $a_2 = -18$ $a_3 = -9$ $a_4 = 0$
15. ..., 27, ____, ____, ____, -3, ... $a_2 = 21$ $a_3 = 15$ $a_4 = 9$ $a_5 = 3$	16. ..., 18, ____, ____, ____, -32, ... $a_2 = 8$ $a_3 = -2$ $a_4 = -12$ $a_5 = -22$
17. ..., 13, ____, ____, ____, ____, -107, ... $a_2 = -7$ $a_3 = -27$ $a_4 = -47$ $a_5 = -67$ $a_6 = -87$	18. ..., -35, ____, ____, ____, ____, -95, ... $a_2 = -45$ $a_3 = -55$ $a_4 = -65$ $a_5 = -75$ $a_6 = -85$

Evaluate the related series of each sequence.

19. -43, -52, -61, -70, -79 $-43 - 52 - 61 - 70 - 79 = -305$	20. 10, 16, 22, 28, 34, 40 $10 + 16 + 22 + 28 + 34 + 40 = 150$
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Evaluate each arithmetic series described.

21. $38 + 47 + 56 + 65 \dots, n = 13$ $d = 47 - 38 = 9$ $S_{13} = \frac{13}{2}(2 \cdot 38 + (13-1) \cdot 9)$ $n = 13$ $S_{13} = 6.5(76 + 108)$ $a_1 = 38$ $S_{13} = 6.5(184)$ $S_{13} = 1196$	22. $11 + 18 + 25 + 32 \dots, n = 19$ $d = 18 - 11 = 7$ $S_{19} = \frac{19}{2}(2 \cdot 11 + (19-1) \cdot 7)$ $n = 19$ $S_{19} = 9.5(22 + 126)$ $a_1 = 11$ $S_{19} = 9.5(148)$ $S_{19} = 1406$
23. $\sum_{n=1}^{25} (4n - 4)$ $d = 4$ $S_{25} = \frac{25}{2}(2 \cdot 0 + (25-1) \cdot 4)$ $n = 25$ $S_{25} = 12.5(0 + 96)$ $a_1 = 4(1) - 4$ $S_{25} = 1200$ $a_1 = 0$	24. $\sum_{i=1}^{15} (6i - 13)$ $d = 6$ $S_{15} = \frac{15}{2}(2 \cdot -7 + (15-1) \cdot 6)$ $n = 15$ $S_{15} = 7.5(-14 + 84)$ $a_1 = 6(1) - 13$ $S_{15} = 7.5(70)$ $a_1 = -7$ $S_{15} = 525$
25. $a_1 = -16, d = -5, n = 15$ $S_{15} = \frac{15}{2}(2 \cdot -16 + (15-1) \cdot -5)$ $S_{15} = 7.5(-32 - 70)$ $S_{15} = 7.5(-102) = -765$	26. $a_1 = -8, d = -7, n = 6$ $S_6 = \frac{6}{2}(2 \cdot -8 + (6-1) \cdot -7)$ $S_6 = 3(-16 - 35)$ $S_6 = 3(-51) = -153$

$$\textcircled{9} \dots, -16, \underline{\quad}, -36, \dots$$

$$a_1 \quad a_2 \quad a_3$$

$$a_2 = -16 - 10 = \boxed{-26}$$

$$a_n = a_1 + (n-1) \cdot d$$

$$-36 = -16 + (3-1) \cdot d$$

$$-36 = -16 + 2d$$

$$+16 \quad +16$$

$$\frac{-20}{2} = \frac{2d}{2}$$

$$-10 = d$$

$$\textcircled{10} \dots, 4, \underline{\quad}, 18, \dots$$

$$a_1 \quad a_2 \quad a_3$$

$$a_2 = 4 + 7 = \boxed{11}$$

$$a_n = a_1 + (n-1) \cdot d$$

$$18 = 4 + (3-1) \cdot d$$

$$18 = 4 + 2d$$

$$-4 \quad -4$$

$$\frac{14}{2} = \frac{2d}{2}$$

$$7 = d$$

$$\textcircled{11} \dots, -23, \underline{\quad}, \underline{\quad}, -113, \dots$$

$$a_1 \quad a_2 \quad a_3 \quad a_4$$

$$a_2 = -23 - 30 = \boxed{-53}$$

$$a_3 = -53 - 30 = \boxed{-83}$$

$$a_n = a_1 + (n-1) \cdot d$$

$$-113 = -23 + (4-1) \cdot d$$

$$-113 = -23 + 3d$$

$$+23 \quad +23$$

$$\frac{-90}{3} = \frac{3d}{3}$$

$$-30 = d$$

$$\textcircled{12} \dots, 34, \underline{\quad}, \underline{\quad}, 334, \dots$$

$$a_1 \quad a_2 \quad a_3 \quad a_4$$

$$a_2 = 34 + 100 = \boxed{134}$$

$$a_3 = 134 + 100 = \boxed{234}$$

$$a_n = a_1 + (n-1) \cdot d$$

$$334 = 34 + (4-1) \cdot d$$

$$334 = 34 + 3d$$

$$-34 \quad -34$$

$$\frac{300}{3} = \frac{3d}{3}$$

$$100 = d$$

$$\textcircled{13} \dots, -30, \underline{\quad}, \underline{\quad}, \underline{\quad}, 10, \dots$$

$$a_1 \quad a_2 \quad a_3 \quad a_4 \quad a_5$$

$$a_2 = -30 + 10 = \boxed{-20}$$

$$a_3 = -20 + 10 = \boxed{-10}$$

$$a_4 = -10 + 10 = \boxed{0}$$

$$a_n = a_1 + (n-1) \cdot d$$

$$10 = -30 + (5-1) \cdot d$$

$$10 = -30 + 4d$$

$$+30 \quad +30$$

$$\frac{40}{4} = \frac{4d}{4}$$

$$10 = d$$

$$\textcircled{14} \dots, -27, \underline{\quad}, \underline{\quad}, \underline{\quad}, 9, \dots$$

$$a_1 \quad a_2 \quad a_3 \quad a_4 \quad a_5$$

$$a_2 = -27 + 9 = \boxed{-18}$$

$$a_3 = -18 + 9 = \boxed{-9}$$

$$a_4 = -9 + 9 = \boxed{0}$$

$$a_n = a_1 + (n-1) \cdot d$$

$$9 = -27 + (5-1) \cdot d$$

$$9 = -27 + 4d$$

$$\begin{array}{r} +27 \\ \hline \frac{36}{4} = \frac{4d}{4} \\ 9 = d \end{array}$$

$$\textcircled{15} \dots, 27, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, -3, \dots$$

$$a_1 \quad a_2 \quad a_3 \quad a_4 \quad a_5 \quad a_6$$

$$a_2 = 27 - 6 = \boxed{21}$$

$$a_4 = 15 - 6 = \boxed{9}$$

$$a_3 = 21 - 6 = \boxed{15}$$

$$a_5 = 9 - 6 = \boxed{3}$$

$$a_n = a_1 + (n-1) \cdot d$$

$$-3 = 27 + (6-1) \cdot d$$

$$-3 = 27 + 5d$$

$$\begin{array}{r} -27 \\ \hline \frac{-30}{5} = \frac{5d}{5} \\ -6 = d \end{array}$$

$$\textcircled{16} \dots, 18, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, -32, \dots$$

$$a_1 \quad a_2 \quad a_3 \quad a_4 \quad a_5 \quad a_6$$

$$a_2 = 18 - 10 = \boxed{8}$$

$$a_4 = -2 - 10 = \boxed{-12}$$

$$a_3 = 8 - 10 = \boxed{-2}$$

$$a_5 = -12 - 10 = \boxed{-22}$$

$$a_n = a_1 + (n-1) \cdot d$$

$$-32 = 18 + (6-1) \cdot d$$

$$-32 = 18 + 5d$$

$$\begin{array}{r} -18 \\ \hline \frac{-50}{5} = \frac{5d}{5} \\ -10 = d \end{array}$$

$$\textcircled{17} \dots, 13, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, -107, \dots$$

$$a_1 \quad a_2 \quad a_3 \quad a_4 \quad a_5 \quad a_6 \quad a_7$$

$$a_2 = 13 - 20 = \boxed{-7}$$

$$a_5 = -47 - 20 = \boxed{-67}$$

$$a_3 = -7 - 20 = \boxed{-27}$$

$$a_6 = -67 - 20 = \boxed{-87}$$

$$a_4 = -27 - 20 = \boxed{-47}$$

$$a_n = a_1 + (n-1) \cdot d$$

$$-107 = 13 + (7-1) \cdot d$$

$$-107 = 13 + 6d$$

$$\begin{array}{r} -13 \\ \hline \frac{-120}{6} = \frac{6d}{6} \\ -20 = d \end{array}$$

$$\textcircled{18} \dots, -35, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, -95, \dots$$

$$a_1 \quad a_2 \quad a_3 \quad a_4 \quad a_5 \quad a_6 \quad a_7$$

$$a_2 = -35 - 10 = \boxed{-45}$$

$$a_5 = -65 - 10 = \boxed{-75}$$

$$a_3 = -45 - 10 = \boxed{-55}$$

$$a_6 = -75 - 10 = \boxed{-85}$$

$$a_4 = -55 - 10 = \boxed{-65}$$

$$a_n = a_1 + (n-1) \cdot d$$

$$-95 = -35 + (7-1) \cdot d$$

$$-95 = -35 + 6d$$

$$\begin{array}{r} +35 \\ \hline \frac{-60}{6} = \frac{6d}{6} \\ -10 = d \end{array}$$