

Arithmetic Mean

Unit 6: Representations of Linear Relations

Find the missing term or terms in each arithmetic sequence.

<p>1. ..., 14, ____, -4, ...</p> <div style="border: 1px solid red; padding: 5px; width: fit-content; margin: 10px auto;"> $a_2 = 5$ </div>	<p>2. ..., -14, ____, 46, ...</p> <div style="border: 1px solid red; padding: 5px; width: fit-content; margin: 10px auto;"> $a_2 = 16$ </div>
<p>3. ..., 11, ____, ____, 41, ...</p> <div style="border: 1px solid red; padding: 5px; width: fit-content; margin: 10px auto;"> $a_2 = 21$ $a_3 = 31$ </div>	<p>4. ..., 24, ____, ____, -6, ...</p> <div style="border: 1px solid red; padding: 5px; width: fit-content; margin: 10px auto;"> $a_2 = 14$ $a_3 = 4$ </div>
<p>5. ..., 20, ____, ____, 620, ...</p> <div style="border: 1px solid red; padding: 5px; width: fit-content; margin: 10px auto;"> $a_2 = 220$ $a_3 = 420$ </div>	<p>6. ..., -21, ____, ____, -621, ...</p> <div style="border: 1px solid red; padding: 5px; width: fit-content; margin: 10px auto;"> $a_2 = -221$ $a_3 = -421$ </div>
<p>7. ..., 5, ____, ____, ____, 45, ...</p> <div style="border: 1px solid red; padding: 5px; width: fit-content; margin: 10px auto;"> $a_2 = 15$ $a_3 = 25$ $a_4 = 35$ </div>	<p>8. ..., -17, ____, ____, ____, -417, ...</p> <div style="border: 1px solid red; padding: 5px; width: fit-content; margin: 10px auto;"> $a_2 = -117$ $a_3 = -217$ $a_4 = -317$ </div> <p style="margin-left: 20px;">#10 on the answer key</p>
<p>9. ..., -20, ____, ____, ____, -4, ...</p> <div style="border: 1px solid red; padding: 5px; width: fit-content; margin: 10px auto;"> $a_2 = -16$ $a_3 = -12$ $a_4 = -8$ </div>	<p>10. ..., 19, ____, ____, ____, -781, ...</p> <div style="border: 1px solid red; padding: 5px; width: fit-content; margin: 10px auto;"> $a_2 = -181$ $a_3 = -381$ $a_4 = -581$ </div> <p style="margin-left: 20px;">#8 on the answer key</p>

11. ..., 35, _____, _____, 435, ...

$$\begin{aligned} a_2 &= 135 \\ a_3 &= 235 \\ a_4 &= 335 \end{aligned}$$

12. ..., 28, _____, _____, 60, ...

$$\begin{aligned} a_2 &= 36 \\ a_3 &= 44 \\ a_4 &= 52 \end{aligned}$$

13. ..., 36, _____, _____, 536, ...

$$\begin{aligned} a_2 &= 136 & a_3 &= 236 \\ a_4 &= 336 & a_5 &= 436 \end{aligned}$$

14. ..., 31, _____, _____, 81, ...

$$\begin{aligned} a_2 &= 41 & a_3 &= 51 \\ a_4 &= 61 & a_5 &= 71 \end{aligned}$$

15. ..., -39, _____, _____, -64, ...

$$\begin{aligned} a_2 &= -44 & a_3 &= -49 \\ a_4 &= -54 & a_5 &= -59 \end{aligned}$$

16. ..., -38, _____, _____, 7, ...

$$\begin{aligned} a_2 &= -29 & a_3 &= -20 \\ a_4 &= -11 & a_5 &= -2 \end{aligned}$$

17. ..., -34, _____, _____, -1234, ...

$$\begin{aligned} a_2 &= -234 & a_3 &= -434 & a_4 &= -634 \\ a_5 &= -834 & a_6 &= -1034 \end{aligned}$$

18. ..., 6, _____, _____, 24, ...

$$\begin{aligned} a_2 &= 9 & a_3 &= 12 & a_4 &= 15 \\ a_5 &= 18 & a_6 &= 21 \end{aligned}$$

19. ..., -36, _____, _____, -636, ...

$$\begin{aligned} a_2 &= -136 & a_3 &= -236 & a_4 &= -336 \\ a_5 &= -436 & a_6 &= -536 \end{aligned}$$

20. ..., -26, _____, _____, -14, ...

$$\begin{aligned} a_2 &= -24 & a_3 &= -22 & a_4 &= -20 \\ a_5 &= -18 & a_6 &= -16 \end{aligned}$$

$$\textcircled{1} \dots, 14, \underline{\quad}, -4, \dots$$

$a_1 \quad a_2 \quad a_3$

$$a_2 = 14 + (2-1)(-9)$$

$$a_2 = 14 + 1(-9)$$

$$a_2 = 14 - 9$$

$$\boxed{a_2 = 5}$$

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

$$-4 = 14 + (3-1) \cdot d$$

$$-4 = 14 + 2d$$

$$\begin{array}{r} -14 \\ -14 \end{array}$$

$$\frac{-18}{2} = \frac{2d}{2}$$

$$\boxed{-9 = d}$$

$$\textcircled{2} \dots, -14, \underline{\quad}, 46, \dots$$

$a_1 \quad a_2 \quad a_3$

$$a_2 = -14 + (2-1)(30)$$

$$a_2 = -14 + 1(30)$$

$$a_2 = -14 + 30$$

$$\boxed{a_2 = 16}$$

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

$$46 = -14 + (3-1) \cdot d$$

$$46 = -14 + 2d$$

$$\begin{array}{r} +14 \\ +14 \end{array}$$

$$\frac{60}{2} = \frac{2d}{2}$$

$$\boxed{30 = d}$$

$$\textcircled{3} \dots, 11, \underline{\quad}, \underline{\quad}, 41, \dots$$

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

$$a_2 = 11 + (2-1) \cdot (10)$$

$$a_2 = 11 + 1(10)$$

$$a_2 = 11 + 10$$

$$\boxed{a_2 = 21}$$

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

$$41 = 11 + (4-1) \cdot d$$

$$41 = 11 + 3d$$

$$\begin{array}{r} -11 \\ -11 \end{array}$$

$$\frac{30}{3} = \frac{3d}{3}$$

$$\boxed{10 = d}$$

$$a_3 = 21 + 10$$

$$\boxed{a_3 = 31}$$

$$\textcircled{4} \dots, 24, \underline{\quad}, \underline{\quad}, -6, \dots$$

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

$$a_2 = 24 + (2-1)(-10)$$

$$a_2 = 24 + 1(-10)$$

$$a_2 = 24 - 10$$

$$\boxed{a_2 = 14}$$

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

$$-6 = 24 + (4-1) \cdot d$$

$$-6 = 24 + 3d$$

$$\begin{array}{r} -24 \\ -24 \end{array}$$

$$\frac{-30}{3} = \frac{3d}{3}$$

$$\boxed{-10 = d}$$

$$a_3 = 14 - 10$$

$$\boxed{a_3 = 4}$$

$$\textcircled{5} \dots 20, \underline{\quad}, \underline{\quad}, 620, \dots$$

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

$$a_2 = 20 + (2-1)(200)$$

$$a_2 = 20 + 1(200)$$

$$a_2 = 20 + 200$$

$$\boxed{a_2 = 220}$$

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

$$620 = 20 + (4-1) \cdot d$$

$$620 = 20 + 3d$$

$$\begin{array}{r} -20 \quad -20 \\ \hline \end{array}$$

$$\frac{600}{3} = \frac{3d}{3}$$

$$\boxed{200 = d}$$

$$a_3 = 220 + 200$$

$$\boxed{a_3 = 420}$$

$$\textcircled{6} \dots -21, \underline{\quad}, \underline{\quad}, -621, \dots$$

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

$$a_2 = -21 + (2-1)(-200)$$

$$a_2 = -21 + 1(-200)$$

$$a_2 = -21 - 200$$

$$\boxed{a_2 = -221}$$

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

$$-621 = -21 + (4-1) \cdot d$$

$$-621 = -21 + 3d$$

$$\begin{array}{r} +21 \quad +21 \\ \hline \end{array}$$

$$\frac{-600}{3} = \frac{3d}{3}$$

$$\boxed{-200 = d}$$

$$a_3 = -221 - 200$$

$$\boxed{a_3 = -421}$$

$$\textcircled{7} \dots, 5, \underline{\quad}, \underline{\quad}, \underline{\quad}, 45, \dots$$

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

$$a_2 = 5 + (2-1)(10)$$

$$a_2 = 5 + 1(10)$$

$$a_2 = 5 + 10$$

$$\boxed{a_2 = 15}$$

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

$$45 = 5 + (5-1) \cdot d$$

$$45 = 5 + 4d$$

$$\begin{array}{r} -5 \quad -5 \\ \hline \end{array}$$

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

$$\boxed{10 = d}$$

$$a_3 = 15 + 10$$

$$\boxed{a_3 = 25}$$

$$a_4 = 25 + 10$$

$$\boxed{a_4 = 35}$$

$$\textcircled{8} \dots, 19, \underline{\quad}, \underline{\quad}, \underline{\quad}, -781, \dots$$

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

$$a_2 = 19 + (2-1)(-200)$$

$$a_2 = 19 + 1(-200)$$

$$a_2 = 19 - 200$$

$$\boxed{a_2 = -181}$$

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

$$-781 = 19 + (5-1) \cdot d$$

$$-781 = 19 + 4d$$

$$\begin{array}{r} -19 \quad -19 \\ \hline \end{array}$$

$$\frac{-800}{4} = \frac{4d}{4}$$

$$\boxed{-200 = d}$$

$$a_3 = -181 - 200$$

$$\boxed{a_3 = -381}$$

$$a_4 = -381 - 200$$

$$\boxed{a_4 = -581}$$

THIS IS ACTUALLY #10, NOT #8

⑧ ... , -17, a_2 , a_3 , a_4 , -417, ... $a_n = a_1 + (n-1) \cdot d$

$$-417 = -17 + (5-1)d$$

$$-417 = -17 + 4d$$

$$\frac{-400}{4} = \frac{4d}{4}$$

$$\boxed{-100 = d}$$

$a_2 = -17 + (2-1)(-100)$
 $a_2 = -17 + 1(-100)$
 $a_2 = -17 - 100$
 $\boxed{a_2 = -117}$

$a_3 = -117 - 100$
 $\boxed{a_3 = -217}$
 $a_4 = -217 - 100$
 $\boxed{a_4 = -317}$

⑨ ... , -20, a_2 , a_3 , a_4 , -4, ... $a_n = a_1 + (n-1) \cdot d$

$$-4 = -20 + (5-1)d$$

$$-4 = -20 + 4d$$

$$\frac{16}{4} = \frac{4d}{4}$$

$$\boxed{4 = d}$$

$a_2 = -20 + (2-1)(4)$
 $a_2 = -20 + 1(4)$
 $a_2 = -20 + 4$
 $\boxed{a_2 = -16}$

$a_3 = -16 + 4$
 $\boxed{a_3 = -12}$
 $a_4 = -12 + 4$
 $\boxed{a_4 = -8}$

⑩ ... , 35, a_2 , a_3 , a_4 , 435, ... $a_n = a_1 + (n-1) \cdot d$

$$435 = 35 + (5-1)d$$

$$435 = 35 + 4d$$

$$\frac{400}{4} = \frac{4d}{4}$$

$$\boxed{100 = d}$$

$a_2 = 35 + (2-1)(100)$
 $a_2 = 35 + 1(100)$
 $a_2 = 35 + 100$
 $\boxed{a_2 = 135}$

$a_3 = 135 + 100$
 $\boxed{a_3 = 235}$
 $a_4 = 235 + 100$
 $\boxed{a_4 = 335}$

⑫ ... , 28, a_2 , a_3 , a_4 , 60, ... $a_n = a_1 + (n-1) \cdot d$

$$60 = 28 + (5-1) \cdot d$$

$$60 = 28 + 4d$$

$$\frac{32}{4} = \frac{4d}{4}$$

$$\boxed{8 = d}$$

$a_2 = 28 + (2-1)(8)$
 $a_2 = 28 + 1(8)$
 $a_2 = 28 + 8$
 $\boxed{a_2 = 36}$

$a_3 = 36 + 8$
 $\boxed{a_3 = 44}$
 $a_4 = 44 + 8$
 $\boxed{a_4 = 52}$

⑬ ... , 36, —, —, —, —, 536, ...
 a_1 a_2 a_3 a_4 a_5 a_6

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

$$536 = 36 + (6-1) \cdot d$$

$$536 = 36 + 5d$$

$$\begin{array}{r} -36 \quad -36 \\ \hline 500 = 5d \\ 5 \quad \quad 5 \\ \hline 100 = d \end{array}$$

$$a_2 = 36 + (2-1)(100)$$

$$a_2 = 36 + 1(100)$$

$$a_2 = 36 + 100$$

$$a_2 = 136$$

$$a_3 = 136 + 100$$

$$a_3 = 236$$

$$a_4 = 236 + 100$$

$$a_4 = 336$$

$$a_5 = 336 + 100$$

$$a_5 = 436$$

⑭ ... , 31, —, —, —, —, 81, ...
 a_1 a_2 a_3 a_4 a_5 a_6

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

$$81 = 31 + (6-1)d$$

$$81 = 31 + 5d$$

$$\begin{array}{r} -31 \quad -31 \\ \hline 50 = 5d \\ 5 \quad \quad 5 \\ \hline 10 = d \end{array}$$

$$a_2 = 31 + (2-1)(10)$$

$$a_2 = 31 + 1(10)$$

$$a_2 = 31 + 10$$

$$a_2 = 41$$

$$a_3 = 41 + 10$$

$$a_3 = 51$$

$$a_4 = 51 + 10$$

$$a_4 = 61$$

$$a_5 = 61 + 10$$

$$a_5 = 71$$

⑮ ... , -39, —, —, —, —, -64, ...
 a_1 a_2 a_3 a_4 a_5 a_6

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

$$-64 = -39 + (6-1)d$$

$$-64 = -39 + 5d$$

$$\begin{array}{r} +39 \quad +39 \\ \hline -25 = 5d \\ 5 \quad \quad 5 \\ \hline -5 = d \end{array}$$

$$a_2 = -39 + (2-1)(-5)$$

$$a_2 = -39 + 1(-5)$$

$$a_2 = -39 - 5$$

$$a_2 = -44$$

$$a_3 = -44 - 5$$

$$a_3 = -49$$

$$a_4 = -49 - 5$$

$$a_4 = -54$$

$$a_5 = -54 - 5$$

$$a_5 = -59$$

⑯ ... , -38, —, —, —, —, 7, ...
 a_1 a_2 a_3 a_4 a_5 a_6

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

$$7 = -38 + (6-1) \cdot d$$

$$7 = -38 + 5d$$

$$\begin{array}{r} +38 \quad +38 \\ \hline 45 = 5d \\ 5 \quad \quad 5 \\ \hline 9 = d \end{array}$$

$$a_2 = -38 + (2-1)(9)$$

$$a_2 = -38 + 1(9)$$

$$a_2 = -38 + 9$$

$$a_2 = -29$$

$$a_3 = -29 + 9$$

$$a_3 = -20$$

$$a_4 = -20 + 9$$

$$a_4 = -11$$

$$a_5 = -11 + 9$$

$$a_5 = -2$$

$$(17) \dots, -34, \frac{\quad}{a_1}, \frac{\quad}{a_2}, \frac{\quad}{a_3}, \frac{\quad}{a_4}, \frac{\quad}{a_5}, \frac{\quad}{a_6}, -1234, \dots$$

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

$$-1234 = -34 + (7-1) \cdot d$$

$$-1234 = -34 + 6d$$

$$\begin{array}{r} -1234 \\ +34 \\ \hline -1200 \end{array} \quad \begin{array}{r} +34 \\ +34 \\ \hline 6d \end{array}$$

$$\frac{-1200}{6} = \frac{6d}{6}$$

$$\boxed{-200 = d}$$

$$a_2 = -34 + (2-1)(-200)$$

$$a_2 = -34 + 1(-200)$$

$$a_2 = -34 - 200$$

$$\boxed{a_2 = -234}$$

$$a_3 = -234 - 200$$

$$\boxed{a_3 = -434}$$

$$a_4 = -434 - 200$$

$$\boxed{a_4 = -634}$$

$$a_5 = -634 - 200$$

$$\boxed{a_5 = -834}$$

$$a_6 = -834 - 200$$

$$\boxed{a_6 = -1034}$$

$$(18) \dots, 6, \frac{\quad}{\quad}, \frac{\quad}{\quad}, \frac{\quad}{\quad}, \frac{\quad}{\quad}, \frac{\quad}{\quad}, 24, \dots$$

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

$$24 = 6 + (7-1) \cdot d$$

$$24 = 6 + 6d$$

$$\begin{array}{r} 24 \\ -6 \\ \hline 18 \end{array} \quad \begin{array}{r} 6d \\ -6 \\ \hline 6 \end{array}$$

$$\frac{18}{6} = \frac{6d}{6}$$

$$\boxed{3 = d}$$

$$a_2 = 6 + (2-1)(3)$$

$$a_2 = 6 + 1(3)$$

$$a_2 = 6 + 3$$

$$\boxed{a_2 = 9}$$

$$a_3 = 9 + 3$$

$$\boxed{a_3 = 12}$$

$$a_4 = 12 + 3$$

$$\boxed{a_4 = 15}$$

$$a_5 = 15 + 3$$

$$\boxed{a_5 = 18}$$

$$a_6 = 18 + 3$$

$$\boxed{a_6 = 21}$$

$$\textcircled{19} \quad \dots, \underset{a_1}{-36}, \underset{a_2}{\quad}, \underset{a_3}{\quad}, \underset{a_4}{\quad}, \underset{a_5}{\quad}, \underset{a_6}{\quad}, \underset{a_7}{-636}, \dots$$

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

$$-636 = -36 + (7-1) \cdot d$$

$$\begin{array}{r} -636 = -36 + 6d \\ +36 \quad +36 \\ \hline \end{array}$$

$$\frac{-600}{6} = \frac{6d}{6}$$

$$\boxed{-100 = d}$$

$$a_2 = -36 + (2-1)(-100)$$

$$a_2 = -36 + 1(-100)$$

$$a_2 = -36 - 100$$

$$\boxed{a_2 = -136}$$

$$a_3 = -136 - 100$$

$$\boxed{a_3 = -236}$$

$$a_4 = -236 - 100$$

$$\boxed{a_4 = -336}$$

$$a_5 = -336 - 100$$

$$\boxed{a_5 = -436}$$

$$a_6 = -436 - 100$$

$$\boxed{a_6 = -536}$$

$$\textcircled{20} \quad \dots, \underset{a_1}{-26}, \underset{a_2}{\quad}, \underset{a_3}{\quad}, \underset{a_4}{\quad}, \underset{a_5}{\quad}, \underset{a_6}{\quad}, \underset{a_7}{-14}, \dots$$

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

$$-14 = -26 + (7-1) \cdot d$$

$$\begin{array}{r} -14 = -26 + 6d \\ +26 \quad +26 \\ \hline \end{array}$$

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

$$\boxed{2 = d}$$

$$a_2 = -26 + (2-1)(2)$$

$$a_2 = -26 + (1)(2)$$

$$a_2 = -26 + 2$$

$$\boxed{a_2 = -24}$$

$$a_3 = -24 + 2$$

$$\boxed{a_3 = -22}$$

$$a_4 = -22 + 2$$

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

$$a_5 = -20 + 2$$

$$\boxed{a_5 = -18}$$

$$a_6 = -18 + 2$$

$$\boxed{a_6 = -16}$$