

Wednesday 11/6

Identify the root of the functions:

1. $y = -2x - 3$

$$\begin{array}{r} 0 = -2x - 3 \\ +3 \quad +3 \\ \hline \end{array}$$

$$\begin{array}{r} 3 = -2x \\ -2 \quad -2 \\ \hline \end{array}$$

$$\boxed{-\frac{3}{2} = x}$$

2. $3x + 2y = 24$

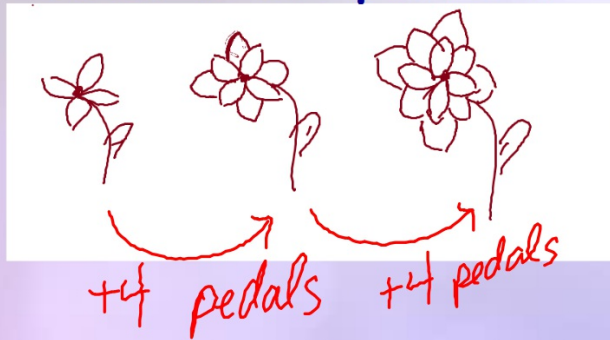
$$3x + 2(0) = 24$$

$$\begin{array}{r} 3x = 24 \\ 3 \quad 3 \\ \hline \end{array}$$

$$x = 8$$

Arithmetic Sequences

What is the pattern?



Determine if the sequence is arithmetic. If so, find the common difference. (+/-)

1. 35, 32, 29, 26, ...

-3 -3 -3

$d = -3$

2. -3, -23, -43, ...

-20 -20

$d = -20$

3. -34, -64, -94, ...

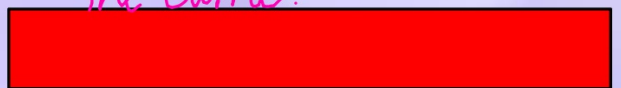
-30 -30

$d = -30$

4. -7, -9, -13, ...

-2 -4

Not arithmetic, b/c the common difference is not the same.



Formula for an arithmetic sequence.

Explicit formula: $a_n = a_1 + d(n-1)$

a_n = output or $f(x)$

d = common difference

a_1 = first term

n = input or x



Given the first term and the common difference, find the first three terms, and the explicit formula.

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

1. $a_1 = 28, d = 10$

$$a_n = 28 + 10(n-1)$$

$$a_n = \boxed{28} + 10n - \boxed{10}$$

$$\boxed{a_n = 10n + 18}$$

Explicit Formula

1st term = $a_1 \Rightarrow n=1$

$$a_1 = 28$$

2nd term = $a_2 \Rightarrow n=2$

$$a_2 = 10(2) + 18$$

$$= 20 + 18$$

$$a_2 = 38 \leftarrow \text{2nd term}$$

3rd term $\Rightarrow a_3 \Rightarrow n=3$

$$a_3 = 10(3) + 18$$

$$= 30 + 18$$

$$a_3 = 48 \leftarrow \text{3rd term}$$

$$\boxed{28, 38, 48}$$

Now find the 27th term.

$$n = 27$$

$$a_{27} = 10(27) + 18$$

$$a_{27} = 270 + 18$$

$$\boxed{a_{27} = 288}$$

2. $a_1 = 35, d = 4$

$$a_n = 35 + 4(n-1)$$

$$a_n = \boxed{35} + 4n - \boxed{4}$$

$$\boxed{a_n = 4n + 31}$$

$$a_1 = 35$$

$$a_2 = 4(2) + 31$$

$$= 8 + 31$$

$$a_2 = 39$$

$$a_3 = 4(3) + 31$$

$$= 12 + 31$$

$$a_3 = 43$$

$$\boxed{35, 39, 43}$$

3. $a_1 = -34, d = -10$



Given a term in an arithmetic sequence and the common difference, find the first three terms and the explicit formula.

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

1. $a_{37} = 249, d = 8$
 $n = 37$

$$249 = a_1 + 8(37-1)$$

$$249 = a_1 + 8(36)$$

$$249 = a_1 + 288$$

$$\begin{array}{r} 249 \\ -288 \\ \hline \end{array} \quad \begin{array}{r} a_1 + 288 \\ -288 \\ \hline \end{array}$$

$$-39 = a_1$$

$$a_n = -39 + 8(n-1)$$

$$a_n = \boxed{-39} + 8n \boxed{-8}$$

$$\boxed{a_n = 8n - 47}$$

$$a_1 = -39$$

$$a_2 =$$

$$a_3 =$$

Given the explicit formula find the first five terms.

$$a_n = 3n - 5$$