Arithmetic Sequences

Bell Work:

1. **Solve** $|2a + 8| = 24$ **and show all work. (2 answers, not 1)**

2. **What are the 2 definitions of slope?**

3. **What is the slope formula?**

4. **How does negative slope go?**

Arithmetic Sequences

1. **What is the function for the arithmetic sequence if**

$a_{13} = 59$ **and** $a_{35} = 147$**?**

$d = \dfrac{147-59}{35-13} = \dfrac{88}{22} = 4$

1. *Find the common difference by using the slope formula.*

2. *Find the first term using the arithmetic sequence function.*

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

$a_{13} = 4(13-1) + a_1$

$59 = 4(12) + a_1$

$59 = 48 + a_1$

$11 = a_1$

$a_n = 4(n-1) + 11$

Arithmetic Sequences

1. **What is the function for the arithmetic sequence if**

$a_{13} = 59$ **and** $a_{35} = 147$**?**

$$d = \frac{147 - 59}{35 - 13} = \frac{88}{22} = 4$$

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

$$a_{35} = 4(35 - 1) + a_1$$

$$147 = 4(34) + a_1$$

$$147 = 136 + a_1$$

$$11 = a_1$$

1. *Find the common difference by using the slope formula.*

2. *Find the first term using the arithmetic sequence function.*

$$a_n = 4(n - 1) + 11$$

It doesn't matter which one you choose. Both numbers would get to the correct first term.

Arithmetic Sequences

2. **What is the function for the arithmetic sequence if**
$a_{26} = 136$ **and** $a_{15} = 235$**?**

$$d = \frac{235-136}{15-26} = \frac{99}{-11} = -9$$

$$a_{26} = -9(26-1) + a_1$$
$$136 = -9(25) + a_1$$
$$136 = -225 + a_1$$
$$361 = a_1$$

1. *Find the common difference by using the slope formula.*

2. *Find the first term using the arithmetic sequence function.*

$$a_n = -9(n-1) + 361$$

Arithmetic Sequences

3. **What is the function for the arithmetic sequence if**

$a_{47} = 166.3$ **and** $a_{86} = 427.6$**?**

$$d = \frac{427.6 - 166.3}{86 - 47} = \frac{261.3}{39} = 6.7$$

$$a_{47} = 6.7(47 - 1) + a_1$$

$$166.3 = 6.7(46) + a_1$$

$$166.3 = 308.2 + a_1$$

$$-141.9 = a_1$$

1. Find the common difference by using the slope formula.

2. Find the first term using the arithmetic sequence function.

$$a_n = 6.7(n - 1) - 141.9$$

Arithmetic Sequences

4. **What is the function for the arithmetic sequence if**
$a_{67} = -211.5$ **and** $a_5 = 420.9$**?**

$$d = \frac{420.9 - (-211.5)}{5 - 67} = \frac{632.4}{-62} = -10.2$$

1. *Find the common difference by using the slope formula.*

2. *Find the first term using the arithmetic sequence function.*

$$a_5 = -10.2(5 - 1) + a_1$$

$$420.9 = -10.2(4) + a_1$$

$$420.9 = -40.8 + a_1$$

$$461.7 = a_1$$

$$a_n = -10.5(n - 1) + 461.7$$

Arithmetic Sequences

1. Find the common difference by using the slope formula.

2. Find the first term using the arithmetic sequence function.

Arithmetic Sequences

Assignment:

Finding Arithmetic Sequences Functions Worksheet