1. Use the given information about an arithmetic sequence to find the number of terms.

$a_6 = -25$ $a_{13} = 3$ Last Term is   59

2. Find the 20th term in this sequence:

$23, 32, 41, 50, \ldots$

3. Find the 14th term for this sequence:

$3, -6, 12, -24, \ldots$

4. The following information is for a Geometric Sequence. Find the 20th term.

$a_3 = 6$ $a_7 = 486$

5. The following information is for a Geometric Sequence. Find the number of terms.

$a_7 = 8$ $a_{13} = 512$ The last term is $131,072$

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1. Use the given information about an arithmetic sequence to find the number of terms.

$a_6 = -25$ $a_{13} = 3$ Last Term is   59

*find common difference!

$$d = \frac{3 - -25}{13 - 6} = \frac{28}{7} = 4$$

*find 1st term:

$$a_1 = a_6 - 5(4) = -25 - 20 = -45$$

* write Explicit formula

$$a_n = -45 + 4(n-1)$$

* Replace a_n with last term and solve for n

$$59 = -45 + 4(n-1)$$
$$104 = 4(n-1) \qquad 26 = n-1$$
$$\boxed{n = 27}$$

2. Find the 20th term in this sequence:

$23, 32, 41, 50, \ldots$

* Arithmetic seq $d = 9$

* Explicit Formula

$$a_n = 23 + 9(n-1)$$

$$a_{20} = 23 + 9(20-1)$$

$$\boxed{a_{20} = 194}$$

3. Find the 14th term for this sequence:

$3, -6, 12, -24, \ldots$

* Geometric Seq $r = -2$

* Explicit Formula

$$a_n = 3(-2)^{n-1}$$

$$a_{14} = 3(-2)^{14-1}$$

$$\boxed{a_{14} = -24,576}$$

4. The following information is for a Geometric Sequence. Find the 20th term.

$a_3 = 6$ $a_7 = 486$

* find common ratio

$$a_3 \cdot r \cdot r \cdot r \cdot r = a_7$$
$$6 r^4 = 486$$
$$\sqrt[4]{r^4} = \sqrt[4]{81}$$
$$r = \pm 3$$

* find 1st term $a_1 = a_3 \div r \div r = 6 \div 3 \div 3 = \frac{2}{3}$

* Explicit Formula

$$a_n = \frac{2}{3}(\pm 3)^{n-1}$$

$$a_{20} = \frac{2}{3}(\pm 3)^{20-1} = \boxed{\pm 774,840,97}$$

5. The following information is for a Geometric Sequence. Find the number of terms.

$a_7 = 8$ $a_{13} = 512$ The last term is 131,072

* find Common ratio:

$$8 r^6 = 512$$
$$\sqrt[6]{r^6} = \sqrt[6]{64}$$
$$r = \pm 2$$

* find 1st Term

$$a_1 = a_7 \div 2 \div 2 \div 2 \div 2 \div 2 \div 2 = \frac{8}{64} = \frac{1}{8}$$

* write explicit formula

$$a_n = \frac{1}{8}(\pm 2)^{n-1}$$

$$131,072 = \frac{1}{8}(\pm 2)^{n-1}$$
$$1048576 = (\pm 2)^{n-1}$$
$$\log_2 1048576 = n-1$$
$$20 = n-1$$
$$\boxed{n = 21}$$

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