3. (a) Determine the 455 th term of the following arithmetic sequence:

$t_{19} = 34$ and $t_{873} = 1742$ *(Hint: Systems of equations might help???)*

$t_n = a + (n-1)d$

$34 = a + 18d$

$1742 = a + 872d$

$1708 = 854d$

$d = 2$

$34 = a + 18(2)$

$-2 = a$

$t_{455} = -2 + (454)(2)$

$= 906$

(b) The fifth term of a geometric sequence is 40 and the eleventh term is $\frac{5}{8}$. Determine the 20th term in this sequence.

(Express your answer as a fraction!!)

$t_n = ar^{n-1}$

$t_5 = 40 = ar^4$

$t_{11} = \frac{5}{8} = ar^{10}$

$\frac{ar^{10}}{ar^4} = \frac{\frac{5}{8}}{40}$

$\sqrt[6]{r^6} = \sqrt[6]{\frac{1}{64}}$

$r = \frac{1}{2}$

$\frac{5}{8} \times \frac{1}{40} = \frac{1}{64}$

$40 = a\left(\frac{1}{2}\right)^4$

$40 = a\left(\frac{1}{16}\right)$

$640 = a$

$t_n = ar^{n-1}$

$t_{20} = \frac{640}{1}\left(\frac{1}{2}\right)^{19}$

$= \frac{640}{524288}$

$= \frac{5}{4096}$

Warm Up

1. Determine how many terms are in each of the following sequences:

(a) 23, 18, 13, 8, ... , -5757

$a=23 \quad d=-5$

$t_n = 23+(n-1)(-5)$

$-5757 = 23+(n-1)(-5)$

$\frac{-5780}{-5} = \frac{(n-1)(-5)}{-5}$

$1156 = n-1$

$1157 = n$

(b) -2, 6, -18, 54, ... , -9565938

$a=-2 \quad r=-3$

$\frac{-9565938}{-2} = \frac{-2(-3)^{n-1}}{-2}$

$4782969 = (-3)^{n-1}$

$\log_3 4782969 = \frac{\log 4782969}{\log 3}$

$(-3)^{14} = (-3)^{n-1}$

$14 = n-1$

$n = 15$

2. Determine how many multiples of 7 are found between 3 and 145 000.

$3, \ldots, 145\,000$

$7, 14, 21, \ldots, 144\,998$

$144998 = 7+(n-1)(7)$

$\frac{144991}{7} = \frac{7(n-1)}{7}$

$20713 = n-1$

$n = 20714$

Practice:

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2 b,c

#3, 4, 5, 6, 9, 10, 11, 16, 20, 24

$t_1 = 7 \quad d = -3$

7, 4, 1, -2

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#1, 5, 6, 7, 9, 10, 17, 19, 23

Worksheet:
Arithmetic and Geometric Sequences

Attachments

4.1 Page 206 Questions.pdf

Introductory worksheet.doc

Worksheet - Simplifying Radicals (Square Roots).pdf

arithmetic and geometric sequences.doc