Precalc

Review Ch. 12

Quiz 12.3-12.4

Test Ch. 12 MCT Tues.

Lesson 12-4 *(Pages 786–793)*

Use the ratio test to determine whether each series is *convergent* or *divergent*.

1. $1^2 + 2^2 + 4^2 + 8^2 + \cdots$

2. $\frac{1}{3} + \frac{2}{3} + \frac{3}{3} + \frac{4}{3} \cdots$

$$\frac{1}{3} \qquad \frac{n+1}{5}$$

$$\begin{array}{cccccc} 1 & 2 & 3 & 4 & n & n+1 \\ \hline 1^2 & 2^2 & 4^2 & 8^2 & (2^{n-1})^2 & (2^n)^2 \end{array}$$

$$2^0 \quad 2^1 \quad 2^2 \quad 2^3$$

$$\frac{2^{2n}}{2^{2n-2}} = \frac{2^n 2^n \cdot 2^2}{2^n 2^n \cdot} = 2^2 = 4$$

$$\frac{n+1}{n} \cdot \frac{3}{n}$$

$$\frac{\frac{n+1}{n} \cdot \frac{3}{n}}{\frac{n}{n}} = \frac{1}{1}$$

Will give comparison test samples

Use the comparison test to determine whether each series is *convergent* or *dive*

5. $\frac{7}{7} + \frac{7}{13} + \frac{7}{19} + \frac{7}{25} + \cdots$

6. $\frac{1}{2^2} + \frac{1}{4^2} + \frac{1}{6^2} + \frac{1}{8^2} + \cdots$

$$\frac{1 \quad 2 \quad 3 \quad 4 \dots n}{2 \quad 7 \quad 7 \quad 7 \quad 7} \atop 7 \quad 13 \quad 19 \quad 25 \quad 6n+1$$

$\frac{1}{n}$ $\boxed{div.}$

$6n+1 \quad n=2 \quad \dfrac{7}{6n+1} > \dfrac{1}{n}$

$\dfrac{7}{13} > \dfrac{1}{2}$

Find the next four terms in each arithmetic sequence.

1. $7, 3, -1, \ldots$

2. $0.5, -1, -2.5, \ldots$

4. $3, 2.8, 2.6, \ldots$

5. $4x, -x, -6x, \ldots$ $d = -5x$

$$-11x \quad -16x \quad -21x \quad -26x$$

For Exercises 7–13, assume that each sequence or series is arithmetic.

7. Find the 16th term in the sequence for which $a_1 = 2$ and $d = 5$.

$$a_{16} = a_1 + (n-1)d$$
$$= 2 + (15) \cdot 5$$
$$= 2 + 75$$
$$= 77$$

$n = 14$

8. Find n for the sequence for which $a_n = -20$, $a_1 = 6$ and $d = -2$.

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

$$-20 = 6 + (n-1)(-2)$$

$$-20 = 6 - 2n + 2$$

$$-20 = 8 - 2n$$

$$\underline{-8 \quad\quad -8}$$

$$\frac{-28}{-2} = \frac{-2r}{-2}$$

$6 + (13)(-2)$

$6 + -26$

$= -20$

$\overset{\shortparallel}{\smile}$

10. Find d for the sequence in which $a_1 = 7$ and $a_{13} = 30$.

Lesson 12-2 *(Pages 766–773)*
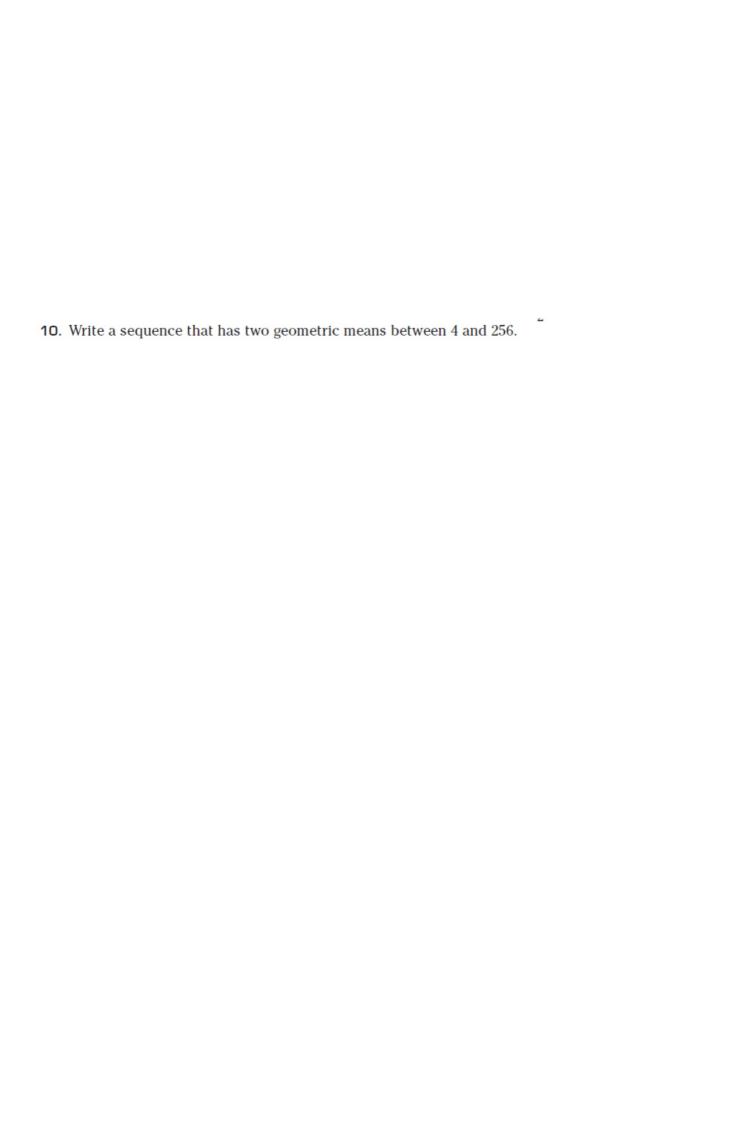Determine the common ratio and find the next three terms

1. 14, 7, 3.5, ... $\times \frac{1}{2}$

2. −2, 4, −8, ...

4. 10, −5, 2.5, ...

5. 8, 8 $\sqrt{2}$, 16, ...

8. If $r = 4$ and $a_8 = 100$, what is the first term of the sequence?

$$a_8 = a_1 r^7$$

$$100 = a_1 (4)^7$$

$$\frac{100}{16,384} = a_1$$

10. Write a sequence that has two geometric means between 4 and 256.

11. What is the sum of the first six terms of the series $3 + 9 + 27 + \cdots$?