1. A line, $y=mx+b$ passes through the point (1,6) and is parallel to $y=4x+6$. What is the value of b?

$m=4 \quad (1,6)$

$y=mx+b$

$6=4(1)+b$

$6=4+b$

$-4 \quad -4$

$b=2$

2. Find the y- intercept of: $y=3x^2+12x-5$

Plug in zero for X

$y=3(0)^2+12(0)-5$

$y=-5$

3. What is the smallest of 3 consecutive positive integers if the product of the smaller two integers is 8 less than 8 times the largest integer?

x

$x+1$

$x+2$

$x(x+1)=8(x+2)-8$

$x^2+x=8x+16-8$

$x^2+x=8x+8$

Geometric Sequences

Main Ideas/Questions	Notes
Geometric Sequences	A sequence in which the ratio (r) remains constant
Common Ratio	Found by dividing a term by the Previous term
Identifying a Geometric Sequence	**Determine whether the following represent geometric sequences. If yes, identify the common ratio.** **1.** 2, 10, 50, 250, ... (5)(5)(5) r=5 **2.** 135, 45, 15, 5, ... $(\frac{1}{3})(\frac{1}{3})(\frac{1}{3})$ $r=\frac{1}{3}$ **3.** 6, 18, 24, 30, ... NO **4.** 7, -14, 28, -56, ... (-2)(-2)(-2) r=-2 **5.** 80, -40, 20, -10, ... $(-\frac{1}{2})(-\frac{1}{2})(-\frac{1}{2})$ $r=-\frac{1}{2}$ **6.** -9, -36, -144, -576, ... (4)(4)(4) r=4
Continuing Geometric Sequences	**Given the geometric sequence, find the next three terms.** r=-3 **7.** 7, -21, 63, -189, 567, -1701 $r=\frac{1}{4}$ **8.** 3072, 768, 192, 48, 12, 3 $r=\frac{1}{2}$ **9.** 8, 4, 2, 1, 1/2, 1/4 r=5 **10.** -5, -25, -125, -625, -3125, -15625

Geometric Sequence Formula	**The n^{th} term of a geometric sequence can be found using the following formula:** $a_n = a_1 \cdot r^{n-1}$ a_n = n^{th} term value a_1 = 1st term r = common ratio	
Examples **Write the rule for the nth term, then find a_7.**	**11.** 3, 9, 27, ... $a_n = 3 \cdot 3^{n-1}$ $a_7 = 3 \cdot 3^{7-1}$ $a_7 = 3 \cdot 3^6$ $a_7 = 2187$	**12.** -4, 20, -100, ... $a_n = (-4) \cdot (-5)^{n-1}$ $a_7 = (-4)(-5)^{7-1}$ $= (-4)(-5)^6$ $= -62{,}500$

1, 5, 25, 125, 625, 3125, 15625	**13.** 400, 200, 100, ... $a_n = (400)\left(\frac{1}{2}\right)^{n-1}$ $a_7 = (400)\left(\frac{1}{2}\right)^6$ $= 6.25$	**14.** 1, 5, 25, ... $a_n = (1)(5)^{n-1}$ $a_7 = (1)(5)^6$ $= 15,625$
	15. -1, -4, -16, ... $a_n = (-1)(4)^{n-1}$ $a_7 = (-1)(4)^6$ $= -4096$	**16.** 729, -243, 81, ... $a_n = (729)\left(-\frac{1}{3}\right)^{n-1}$ $a_7 = (729)\left(-\frac{1}{3}\right)^6$ $= 1$
	17. 6, -12, 24, ... $a_n = (6)(-2)^{n-1}$ $a_7 = (6)(-2)^6$ $= 384$	**18.** 8, 12, 18, ... $a_n = (8)\left(\frac{3}{2}\right)^{n-1}$ $a_7 = (8)\left(\frac{3}{2}\right)^6$ $= 91.125$

(3÷2)^6

*8

$a_n = (a_1)(r)^{n-1}$

Real Life Application

Year	Value ($)
1	10,000
2	8,000
3	6,400

The table to the left shows a car's value for 3 years after it is purchased.

19. Write a rule to represent the car's depreciation.

$a_n = (10{,}000)\left(\frac{4}{5}\right)^{n-1}$

20. What will be the value of the car after 10 years?

$a_{10} = (10{,}000)\left(\frac{4}{5}\right)^{9}$

$= \$1342.18$

(4÷5)^9

*10000

RECURSIVE FORMULA

$$a_n = a_{n-1} * r$$

a_n = n^{th} term

a_{n-1} = previous term

r= common ratio