

Module 3 Regents Review

Green Review Book Questions – Test 6

#2 Geometric sequence - on ref. sheet

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

$$a_n = 5(2)^{n-1}$$

$a_1 = 5$
 $r = 2$

$a_n = 2(a_{n-1})$ CHOICE (1)
 or
 $a_{n+1} = 2(a_n)$

#8

t	4	6
h	160	220

Avg. Rate of Change = $\frac{\Delta y}{\Delta x} = \frac{220-160 \text{ gal}}{6-4 \text{ hr}}$

$$= \frac{60}{2} = 30 \text{ gallons/hr}$$

CHOICE (1)

#11

$y = a \left(1 + \frac{r}{n}\right)^{nt}$ quarterly $n=4$

$$y = 6000 \left(1 + \frac{.08}{4}\right)^{4t}$$

Annual Rate $y = 6000 (1.0824)^t$

$r = .0824$ CHOICE (1)

#12

$$y = Pe^{rt}$$

$r = -.045$

$$\frac{250000}{500000} = \frac{500000 e^{-.045t}}{500000}$$

$$\ln .5 = \ln e^{-.045t}$$

ln e = 1

$$\frac{\ln .5}{-.045} = \frac{-045t}{-.045}$$

" t

CHOICE (2)

#14

$$f(x) = 3(5)^x$$

$$f(x) + 4 = 3(5)^x + 4$$

CHOICE (3)

#22

Inverse: switch x and y, solve for y

$$g(x) = \frac{x}{1} = \frac{y+5}{y-2}$$

$$xy - 2x = y + 5$$

$$xy - y = 2x + 5$$

$$\frac{y(x-1)}{x-1} = \frac{2x+5}{x-1}$$

$$y = \frac{2x+5}{x-1}$$

CHOICE (1)

$$\frac{17}{1}, \frac{18.5}{2}, \frac{20}{3}, \frac{21.5}{4}, \frac{23}{5}$$

#23 $j(x) = (8x)^{1/2}$ CHOICE (2)
 $k(x) = \sqrt[3]{x}$
 $f(x) = j(2x)k(8x)$
 $= (8(2x))^{1/2} \cdot \sqrt[3]{8x} = (16x)^{1/2} \cdot (8x)^{1/3}$

$8x^{5/6}$
 $4x^{1/2} \cdot 2x^{1/3}$

#30 $a_2 = 18.5$
 $a_n = a_{n-1} + 1.5$
 Arithmetic Explicit:
 $a_n = 17 + 1.5(n-1)$
 $a_5 = 17 + 1.5(5-1) = 23$

a_5 is the # of smart phones in the US in millions in 2019

#34 $P = 19413 \cdot (.96)^{-4t}$
 $P = 19413 (x)^t$
 $P = 19413 (1.177)^t$
 (b) rate of growth annually:
 $x = 1+r$ $r = .177$
 17.7%

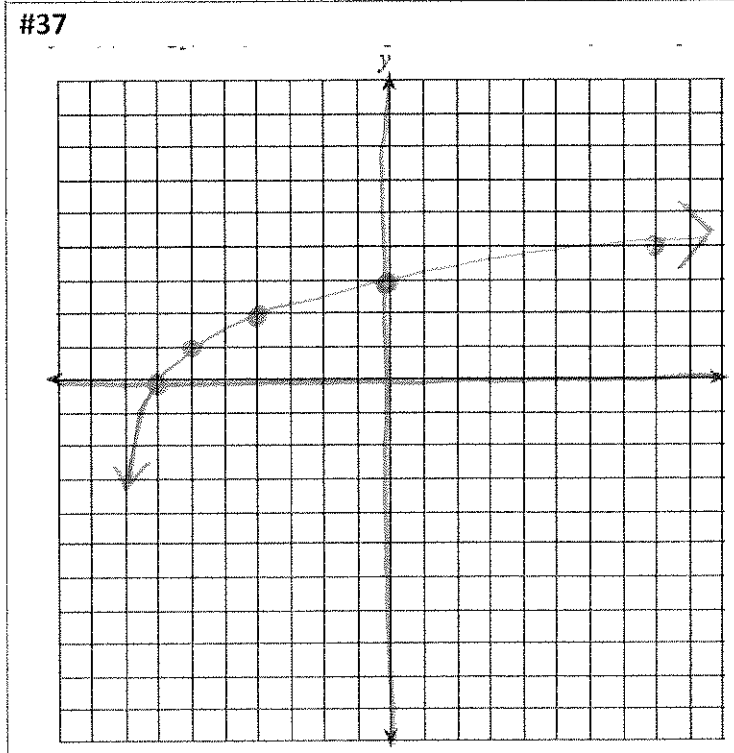
$P = \text{pop}$
 $t = \text{years after 2015}$

(c) Avg Rate of change

t	P
0	19413
5	43920.573

$$\frac{\Delta y}{\Delta x} = \frac{24507.573}{5} = 4901.5146$$

4902 people/yr.



$$h(x) = \log_2(x+8)$$

x	y
-7	0
-6	1
-4	2
0	3
8	4

x int = -7
 y int = 3
 product = (-7)(3) = -21