CHAPTER 3 REVIEW

FORMULAS

$y = mx + b$ $\qquad m = \frac{y_2 - y_1}{x_2 - x_1}$

$Ax + By = C$ $\qquad m = -\frac{A}{B}$

$y - y_1 = m(x - x_1)$

AVG. RATE OF $\Delta = \frac{f(b) - f(a)}{b - a}$

$y = a \cdot b^x$ $\qquad y = a(1+r)^t$

$A = P\left(1 + \frac{r}{n}\right)^{nt}$

$y = a(1-r)^t$

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

$a_n = a_1 r^{n-1}$ GEOMETRIC

SEC. 3.1 PROPERTIES OF EXPONENTS

SIMPLIFY

① $(2xy^2)^2 =$

② $3(w^3)^5 =$

③ $(3x^{-2}y^3)^{-2} =$

④ $\left(\frac{3x^2yz}{2xy}\right)^0 =$

⑤ $\left(\frac{3x^{-2}y}{6xy^{-2}z}\right)^2 =$

⑥ $\left(\frac{x^2}{y^2}\right)^2 =$

⑦ $(4a^3b^2)(3a^{-4}b^{-3}) =$

⑧ $(4xy^2)^{-1} =$

⑨ $\frac{3x^3y^{-1}z^{-1}}{x^{-4}y^0z^0} =$

⑩ $\frac{r^2}{3r^3} =$

SEC. 3.2 SIMPLIFYING RADICALS

(1) $3\sqrt{5} \cdot \sqrt{2} =$

(2) $2\sqrt{10} \cdot 5\sqrt{5} =$

(3) $\sqrt{64x^2y^3} =$

(4) $\sqrt{147} =$

(5) $3\sqrt{5} + 2\sqrt{5} =$

(6) $6\sqrt{18} - 4\sqrt{32} =$

(7) $3\sqrt{45} + 4\sqrt{80} - 2\sqrt{125} =$

(8) $\frac{2\sqrt{7}}{\sqrt{5}} =$

(9) $\frac{\sqrt{11}}{\sqrt{6}} =$

(10) $6\sqrt{7} - 3\sqrt{7} =$

(11) $\sqrt{200m^4n} =$

(12) $\sqrt{28x^3y^3} =$

(13) $3\sqrt{3}\,(3\sqrt{2} + 5) =$

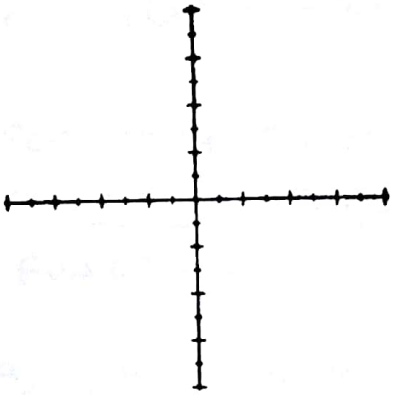
(14) $(-4\sqrt{28x})(\sqrt{7x^3}) =$

(15) $\sqrt{300} =$

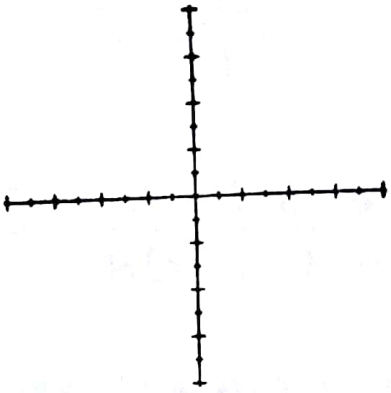
SEC 3.3 EXPONENTIAL FUNCTIONS

GRAPH EACH OF THE FOLLOWING FUNCTIONS. GIVE Y-INTERCEPT, EQUATION OF HORIZONTAL ASYMPTOTE, DOMAIN, RANGE, AND END BEHAVIOR.

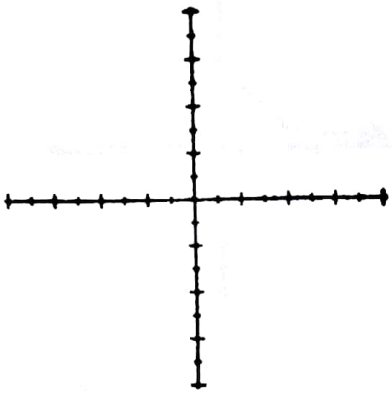
(1) $f(x) = 2^x$



(2) $g(x) = 3\left(\frac{1}{2}\right)^x$



(3) $h(x) = 2(3)^x - 3$



(4) GIVE THE EQUATION OF THE HORIZONTAL ASYMPTOTE FOR THE GRAPHS OF EACH OF THE FOLLOWING FUNCTIONS.

(A) $f(x) = 2(3.1)^x$

(B) $g(x) = 1.5(2)^x - 1$

(C) $h(x) = -3\left(\frac{1}{2}\right)^x + 2$

(5) FOR EACH FUNCTION, INDICATE WHETHER IT IS LINEAR OR EXPONENTIAL AND GIVE THE EQUATION OF THE FUNCTION.

(A)

x	3	4	5	6
$f(x)$	8	10	12	14

(B)

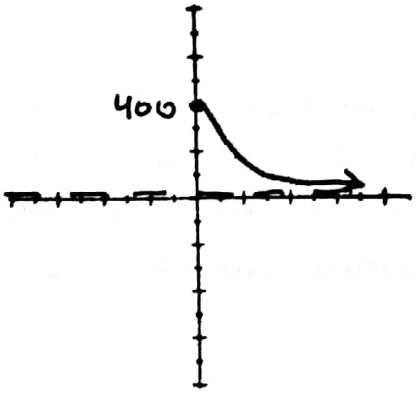
x	0	1	2	3
$g(x)$	3	9	27	54

(C)

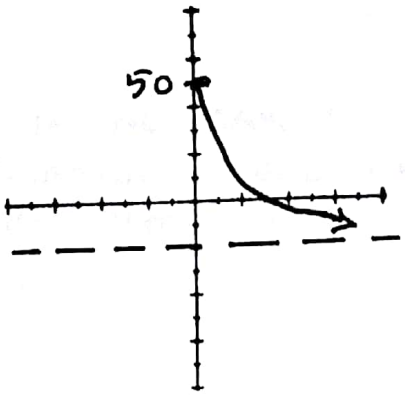
x	2	3	4	5
$h(x)$	27	9	3	1

(6) GIVE DOMAIN + RANGE FOR THE FUNCTIONS GRAPHED BELOW:

(A)



(B)



SEC 3.4 GROWTH + DECAY

(1) JOSEPH INVESTED $300 IN AN ACCOUNT THAT GIVES 5.5% INTEREST COMPOUNDED QUARTERLY. HOW MUCH WILL HIS INVESTMENT BE WORTH IN 5 YEARS. SHOW SET-UP.

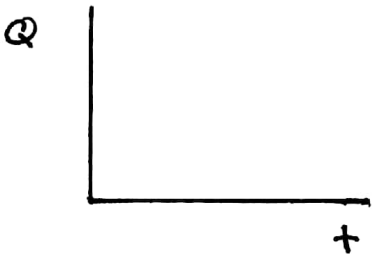
(2) SUPPOSE A $32,000 CAR DEPRECIATES AT A RATE OF 4% PER YEAR. WHAT WILL BE THE CAR'S VALUE IN 10 YEARS? SHOW SET-UP.

(3) THE FOLLOWING FUNCTION SHOWS HOW A RADIOACTIVE ISOTOPE DECAYS AS A FUNCTION OF t YEARS.

$$Q = 100(.98)^t$$

HOW MUCH (%) OF THE ISOTOPE IS LOST EACH YEAR?

(4) SKETCH A GRAPH OF THE FUNCTION IN QUESTION (3) ABOVE. STATE THE DOMAIN + RANGE.



(5) THE POPULATION OF HYENAS IN NC WAS 2152 IN 2000. ASSUMING THE POPULATION IS GROWING AT AN ANNUAL RATE OF 1% PER YEAR, WHEN WILL THE POPULATION REACH 2200.

SEC 3.5 GEOMETRIC SEQUENCES

(1) STATE WHETHER EACH SEQUENCE IS ARITHMETIC, GEOMETRIC, OR NEITHER

(A) 5, 10, 15, 20, 25, ...

(B) 7, -14, 28, -56, ...

(C) 16, 24, 36, 54, ...

(2) FIND THE NEXT 3 TERMS OF EACH SEQUENCE.

(A) 1, 6, 36, ...

(B) 28, 30, 32, ...

(C) $\frac{1}{4}, \frac{1}{16}, \frac{1}{64}, \ldots$

(D) 0.05, 0.5, 5, 50, ...

(3) WRITE A FORMULA FOR a_n, THE nth TERM, OF EACH SEQUENCE IN QUESTION (2) ABOVE.

(A)

(B)

(C)

(D)

(4) FIND THE 10th TERM, a_{10}, OF EACH SEQUENCE IN QUESTION (2) ABOVE. SHOW SET-UP.

(A)

(B)

(C)

(D)