

*Directions: Review the following topics using your notes and textbook. Try the sample problems and work (or re-work) some of the odd-numbered problems for extra practice. Check your answers with the back of the book.*

- Simplifying expressions with exponents (sections 6-2 through 6-5):

a) Simplify:  $\frac{(4a^2b)^3}{4a^{-2}b}$

b) Simplify:  $\left(\frac{pq^3}{5p^{-3}q}\right)^{-2}$

- Solving logarithmic and exponential equations (sections 6-8 through 6-11):

c) Solve for x:  $\log_x\left(\frac{8}{125}\right) = 3$

d) Solve for x:  $\log_{32}x = \frac{1}{5}$

e) Solve for x:  $\log_2\frac{1}{128} = x$

f) Solve for x and round answer to 3 decimal places:  $e^{3x} = 123$

g) Solve for x and round answer to 3 decimal places:  $13^x = 204$

h) Solve for x and round answer to 3 decimal places:  $3^{3x} = 192$

- Finding and graphing inverses of functions (section 6-12):

i) Find the inverse:  $f(x) = (x+5)^3$

j) Find the inverse and graph both functions on the same set of axes:  $f(x) = 5^x$

- Solving growth and decay problems (section 6-14):

k) Solve using  $y = n \cdot e^{kt}$ : You have invested \$3500 at an annual interest rate of 2.5%, compounded continuously. When will your investment triple? (Round to the nearest whole year.)

- Operations with rational expressions (sections 7-7, 7-8):

l) Simplify:  $\frac{x^2-100}{x^2-25} + \frac{x-10}{x-5}$

m) Simplify:  $\frac{5}{x^2-4x-12} - \frac{1}{6-x}$

n) Simplify:  $\frac{x^3-x}{14} \cdot \frac{4}{2x-2}$

- Solving quadratic equations by factoring (section 7-10):

o) Solve by factoring:  $2x^2 = 6 - 11x$

p) Solve by factoring:  $x^2 = 17x$

- Solving rational equations (section 7-10):

q) Solve. Discard any extraneous solutions:  $\frac{x}{x+9} + \frac{9}{9-x} = \frac{x^2+81}{x^2-81}$

r) Solve. Discard any extraneous solutions:  $1 + \frac{3}{x-1} = \frac{x^2}{x-1}$

- Graphing rational functions (sections 7-2, 7-9):

s) Graph, showing all discontinuities and asymptotes:  $f(x) = \frac{x^2-4x+3}{x^2-x-6}$

t) Graph, showing all discontinuities and asymptotes:  $f(x) = \frac{1}{x^2-2x-15}$

- Variation functions (section 7-11):

u) The time it takes you to do your math homework varies directly with the amount of time elapsed since math class. Suppose it takes you 20 minutes to do your work if you do it 8 hours after math class.

- Write the particular equation.
- How long will it take you to do your homework if you wait until 36 hours after math class?

v) The volume of a fixed amount of gas (at a constant temperature and pressure) is inversely proportional to the pressure of the gas. Suppose a pressure of 23 psi compresses a gas to a volume of 720 cubic feet.

- Write the particular equation.

○ What pressure would be necessary to compress the gas to a volume of 96 cubic feet?

- Graphing radical functions using a table (sections 8-1, 8-2):

w) Graph using a table of values and a domain of  $-2 \leq x \leq 7$ :  $f(x) = \sqrt{x+2} + 3$

- Simplifying radical expressions (section 8-3):

x)  $15\sqrt{6} + \frac{12}{\sqrt{6}} - \sqrt{486} + 3\sqrt{24}$

y)  $(4\sqrt{5} - \sqrt{3})^2$

- Solving radical equations (section 8-4):

z) Solve and check. Discard extraneous solutions.  $\sqrt{x+1} = \sqrt{2x+1}$

aa) Solve and check. Discard extraneous solutions.  $\sqrt{x+2} + 4 = x$

- Graphing circles, ellipses, parabolas (sections 9-2, 9-3, 9-5)

p. 466 #8, 10

p. 476 #2, 6

p. 507 R1a ix and xiv

- Finding zeros of higher degree functions, more quadratic equations (sections 10-3, 10-4):

p. 529 #10, 24, 26, 28

- Graphing higher degree polynomial functions (section 10-4):

p. 540 #14, 20, 26, 30, 34, 38