Midterm Review Answers (APPC) 25-26

(1) a. Increasing $(3, \infty)$ and Decreasing $(-\infty, 3)$

b. Concave up $(-\infty, \infty)$ because the rate of change is increasing

C. AROC [2, 5] = 1

D. AROC $[2, 2 + h] = h - 2$;

AROC on given intervals: $-1.5, -1.9, -1.99, -2.1$

(2). $(3x - 2)^4 = 81x^4 - 216x^3 + 216x^2 - 96x + 16$

(3). $r(x) < 0$ on the interval $\left(-3, \frac{7}{5}\right)$

(4). a. 3 b. $\frac{28}{5}$ c. 12

(5). a. 3 b. 7 c. 6 d. 3

(6). $\lim_{x \to \infty} g(x) = 6$

(7) a. hole at $\left(2, \frac{4}{3}\right)$

b. V. A. at $x = -1$; $\lim_{x \to 1^-} r(x) = -\infty$; $\lim_{x \to 1^+} r(x) = \infty$

c. H.A. at $y = 1$; $\lim_{x \to \infty} r(x) = 1$; $\lim_{x \to -\infty} r(x) = 1$

d. there would now be a slant asymptote at $y = x + 1$

(8). a. 18 b. $log_{1.05}(15) = \frac{log 15}{log 1.05} = 55.504$ c. $\left(\frac{10}{3}\right)^{\frac{2}{7}} + 2 = 3.411$

(9). $y = (x - 2i)(x + 2i)(x - 4)(x - 4)$

$= (x^2 + 4)(x - 4)(x - 4)$

$= (x^4 - 8x^3 + 20x^2 - 32x + 64$

(10). 5 roots … $x = 0, 7 \pm 2i; \ \pm 5i$

(11). coefficient = 945

(12). a) $P(25) = 402.5$

b) Largest possible value = 780

c) $\lim_{t \to \infty} P(t) = 780$

(13). a) $a_n = 4(n - 3) - 6$

b) geometric … $a_n = 2\left(\sqrt{3}\right)^{n-3}$

(14). $\left(\frac{7}{2}, 0\right)$

(15). *will review answers in class.*

(16). $x = 5$

(17). a. $f^{-1}(x) = (x - 8)^3 + 7$ b. $h^{-1}(x) = (2)^{\frac{x-7}{4}} + 5$

(18). a. ∞ b. $-\infty$ c. $-\infty$ d. 1

e. -2 f. 1 g. 0 h. DNE

FRQ Question

a) $c(4) = -8$

b) i. zeros at $x = 0, -2, 8$

ii. end behavior: $\lim_{x \to \infty} a(x) = \infty$

c) quadratic; common second difference