

1st retest review

1 a) $D: (-\infty, \infty)$ $R: [5, \infty)$

b) $9 - x^2 > 0$

$9 > x^2$

$R: (\frac{1}{3}, \infty)$ ← Don't stress about this one!

$-3 < x < 3$ or $(-3, 3)$

2 a) $y = \frac{5}{x^2 - 5x} = \frac{5}{x(x-5)}$

H.A: $y = 0$
V.A: $-x = 0, x = 5$

b) $\frac{3x}{x-4}$

H.A: $y = 3$
V.A: $x = 4$

3 A) Dec: $(-\infty, 1)$
Inc: $(1, \infty)$

B) inc: $(-\infty, \infty)$

4 a) Bounded

B) Bounded above

5 a) local max: $(-1, 2)$
local min: $(1, -2)$

B) Absolute max: $(2, 1)$
absolute min: $(-2, -1)$

6 a) $y = 3x^2 - 4|x|$
 $= 3(-x)^2 - 4|-x|$
 $= 3x^2 - 4|x|$
even

b) $\frac{x^2 - 2}{x^3} = \frac{(-x)^2 - 2}{(-x)^3}$
 $= \frac{x^2 - 2}{-x^3} = -\frac{x^2 - 2}{x^3}$
odd

7 A) $x^3 = (\sqrt[3]{y-8})^3$
 $x^3 = y - 8$
+8 +8

$y = x^3 + 8$ yes

B) $x = y^2 + 2$
 $\sqrt{x-2} = \sqrt{y^2}$

$\pm \sqrt{x-2} = y$ NO

⑧ A) $x^3 + x + 2x - 1$
 $(2)^3 + 2 + 2(2) - 1$
 $8 + 2 + 4 - 1 = \boxed{13}$

⑧ B) $(2x-1)^3 + 2x - 1$

⑨ $f(3) = -2$ $f(4) = -9$ $(-3, -2), (4, -9)$

$m = \frac{-9 - (-2)}{4 - 3} = \frac{-7}{1} = -7$

$y + 2 = -1(x + 3)$
 $y + 2 = -x - 3$
 $\boxed{y = -x - 5}$

⑩ A) v. stretch of 3
 Right 2
 up 1

B) $-(2x+4)^2 - 3 \rightarrow -(2(x+2))^2 - 3$
 reflection (x-axis)
 H. shrink by 1/2
 left 2, down 3

⑪ A. v: (3, 5)
 AOS: $x = -3$

B) $x = \frac{16}{2(-2)} = -4$
 $y = -2(-4)^2 - 16(-4) - 31$
 $= -39$

v: (-4, -39)
 AOS: $x = -4$

⑫ $y = a(x-h)^2 + k$
 $\boxed{y = \frac{5}{9}(x+2)^2 - 3}$

$2 = a(1+2)^2 + 3$
 $5 = 9a$ $a = \frac{5}{9}$

- ⑬ A) Power B) Both C) Power D) Polynomial
 Constant 4 Constant/LC: 3/3 constant: -2 LC: 1
 Power 1/3 Power/Degree: 4
 Direct Direct

14 Zeros: $x=1$ mult 3, 2 mult 2, 5

Degree = 6

EB $\uparrow\uparrow$

y-intercept: $2(-1)^3(-2)^2(5) = -40$

