

Sem 2 Final Exam Review

(B) 1) $\frac{\sqrt[3]{270x^{20}}}{\sqrt[3]{5x}} = \sqrt[3]{54x^{19}} = \sqrt[3]{3 \cdot 3 \cdot 3 \cdot 2 \cdot x^{18} \cdot x^1}$ $\boxed{3x^6 \sqrt[3]{2x}}$

(D) 2) $\log x^3 + \log y^2 - \log 3 = \boxed{3 \log x + 2 \log y - \log 3}$

(C) 3) $\log_2 x = 3 \rightarrow 2^3 = x \quad x = 8$

(C) 4) $5x = \sqrt{10+5x} \rightarrow 25x^2 = 10+5x \rightarrow 25x^2 - 5x - 10 = 0$
 $5(5x^2 - 3x - 2) = 0$
 $\boxed{-\frac{2}{5}, 1}$ $\leftarrow 5(5x+2)(x-1)$

(D) 5) $\sqrt{10+2x} = 5+x \rightarrow 10+2x = (5+x)^2 = 10+2x+25+10x+x^2$
 $0 = x^2 + 8x + 15$
 $\boxed{-5, -3}$ $\leftarrow (x+5)(x+3)$

(B) 6) $\left(\frac{1}{2}\right)^x = 17 \rightarrow \log\left(\frac{1}{2}\right)^x = \log 17 \rightarrow \frac{x \log(1/2)}{\log(1/2)} = \frac{\log 17}{\log(1/2)}$
 $\boxed{x = -4.087}$

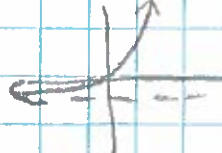
(D) 7) $\log_5(4x+1)^4 + \log_5(2x+6)^5 = \boxed{\log_5((4x+1)^4(2x+6)^5)}$

(B) 8) $\sqrt[3]{-32x^{15}} = \boxed{-2x^5}$

(B) 9) $5000e^{(-.03 \cdot 4)} = \boxed{\$5986.09}$

(C) 10) $\frac{3}{3} \frac{\sqrt[3]{x+4}}{3} = 12 \rightarrow \left(\sqrt[3]{x+4} = 4\right)^3 \rightarrow x+4 = 64 \rightarrow \boxed{x=60}$

(B) 11) $\sqrt{2x+5} - 2 = 3 \rightarrow \sqrt{2x+5} = 5 \rightarrow 2x+5 = 25 \rightarrow 2x = 20 \rightarrow \boxed{x=10}$

(12, 13) $y = 5(3)^{x-2} - 1$ 

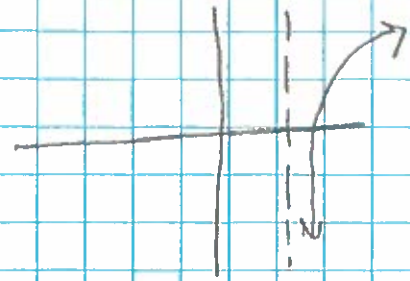
\downarrow \downarrow
 (D) (E)
 DOM - \mathbb{R}
 RAN $\rightarrow (-1, \infty)$

14, 15)
(E), (A)

$$y = \log(x-2) - 1$$

$$\text{DOM} : (2, \infty)$$

$$\text{RAN} : \mathbb{R}$$



(D) 16) $\log_a b = c \rightarrow a^c = b$

(C) 17) $y = \ln(x+3) \rightarrow e^y = x+3 \rightarrow e^x = y+3 \rightarrow \boxed{y = e^x - 3}$

(A) 18) $3 \log x - \log 2 \rightarrow \boxed{\log \frac{x^3}{2}}$

(D) 19) $3^x = 45 \rightarrow \frac{x \log 3}{\log 3} = \frac{\log 45}{\log 3} \rightarrow \boxed{3.465}$

(D) 20) $7^2 = 4x+5 \rightarrow 49 = 4x+5 \rightarrow 44 = 4x \rightarrow \boxed{x=11}$

(B) 21) $x = -10, y = -7$

(B) 22) $\frac{(x+1)(x+3)}{(x+1)(x-5)} - \frac{x(x-5)}{(x+1)(x-5)} = \frac{(x+1)(x+3) - x(x-5)}{(x+1)(x-5)} = \frac{x^2+4x+3 - x^2+5x}{(x+1)(x-5)} = \frac{9x+3}{(x+1)(x-5)}$

(D) 23) $-6(2) = x(x+7) \rightarrow -12 = x^2+7x \rightarrow 0 = x^2+7x+12 = (x+4)(x+3)$
 $\boxed{-4, -3}$

(C) 24) $\frac{(x-11)(x+4)}{(x+8)(x-2)} \cdot \frac{(x+9)(x+8)}{(x-11)(x+9)} = \frac{x+4}{x-2}$

(B) 25) $(27a^{-9})^{-\frac{4}{3}} = 27^{\frac{4}{3}} a^{12} = \frac{a^{12}}{\sqrt[3]{27^4}} = \frac{a^{12}}{3^4} = \frac{a^{12}}{81}$

(B) 26) $\sqrt{2+6\sqrt{4 \cdot 2}} + 3\sqrt{4 \cdot 2} = \sqrt{2+6\sqrt{8}} + 3\sqrt{8} = \sqrt{2+48\sqrt{2}} + 6\sqrt{2} = \boxed{50\sqrt{2}}$

(A) 27) $21+3\sqrt{5}+7\sqrt{5}+\sqrt{\frac{5}{25}} = \boxed{26+10\sqrt{5}}$

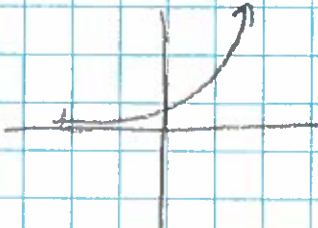
$$(A) 28) (x+1) + (x-1) = \boxed{2x}$$

$$(D) 29) (x+1)(x-1) = x^2 + x - x - 1 = \boxed{x^2 - 1}$$

$$(A) 30) f(x-1) = (x-1) + 1 = x$$

$$(C) 31) 2(x+3)^{\sqrt{3}} = 6 \rightarrow \sqrt[3]{x+3} = \sqrt[3]{3} \Rightarrow x+3 = 27 \quad \boxed{x=24}$$

$$(A) 32) \frac{(x+5)(x+7)}{(x+4)(x+5)} = \frac{(x+3)(x+4)}{(x+7)(x-7)} = \boxed{\frac{x+3}{x-7}}$$

$$(A) 33) y = 2^x$$


$x=0 \rightarrow x\text{-axis}$

$$(B) 34) \log_0 \frac{x}{y} = \boxed{\log_0 x - \log_0 y}$$

$$(B) 35) x = \frac{k}{y} \rightarrow -3 = \frac{k}{-2} \rightarrow k = 6 \quad \boxed{y = \frac{6}{x} \text{ or } x \cdot y = 6}$$

$$(A) 36) z = kxy \rightarrow 10 = k(5)(2) \rightarrow k = 1 \quad \boxed{z = 1xy}$$

$$(C) 37) \frac{x}{1} = \frac{z}{x-1} \quad x(x-1) = z \Rightarrow x^2 - x = z \Rightarrow x^2 - x - z = 0$$
$$(x-2)(x+1) = 0$$
$$\boxed{2, -1}$$

$$(D) 38) \frac{2(x+1)}{2 \cdot x} + \frac{x(x)}{2(x)} \rightarrow 2x+2+x^2 \rightarrow \boxed{\frac{x^2+2x+2}{2x}}$$

$$(A) 39) \frac{1}{x} \div \frac{x}{x^2+1} \Rightarrow \frac{1}{x} \cdot \frac{x^2+1}{x} = \boxed{\frac{x^2+1}{x^2}}$$

$$(B) 40) y = -\frac{1}{5}x + 8 \rightarrow x = -\frac{1}{5}y + 8 \rightarrow x - 8 = \left(-\frac{1}{5}y\right)$$
$$\boxed{5x + 40 = -y}$$

$$(B) 41) y = \frac{1}{4}x^3 + 1 \rightarrow x = \sqrt[3]{4y-4} \rightarrow (x-1) = \left(\frac{1}{4}y^3\right)^{\frac{1}{3}} \rightarrow \sqrt[3]{4x-4} = \sqrt[3]{y^3}$$
$$\sqrt[3]{u} = \sqrt[3]{4x-4}$$

(A) 42) $y = 5\sqrt[8]{x-1} + 3$ $x-1 \geq 0$
 $x \geq 1$ $y \geq 3$
 $[1, \infty)$ $[3, \infty)$

(A) 43) $\frac{x^{5/3}}{y^{5/3}} = \frac{x}{y^3}$

(B) 44) 20 (C) 45) $35 - 20 = 15$ (D) 46) $40 - 10 = 30$

(B) 47) tails left \rightarrow neg skew

(C) 48) $\log_b y - \log_b b = \log_b \left(\frac{y}{b}\right)$

(D) 49) $\log_n \left(\frac{4x^9}{z^8}\right)^{1/6} = \log_n \left(\frac{4^{1/6} x^{9/6} z^{-8/6}}{1}\right) = \left[\frac{1}{6} \log_n 4 + \frac{3}{2} \log_n x - \frac{4}{3} \log_n z\right]$

(D) 50) $\log_m x^4 - \log_m (a^2)^7 \rightarrow \log_m \frac{x^4}{a^{14}}$

(B) 51) Horiz Asym $\rightarrow y=5$ flipped

(B) 52) Horiz Asym $y=2$ flipped

(B) 53) $y = 25000(1 - .15)^t \rightarrow y = 25000(.85)^t$

(A) 54) $y = 30000(1 + .2)^t$

(C) 55) $\frac{30000}{10000} = \frac{10000e^{(.08t)}}{10000} \rightarrow 3 = e^{.08t} \rightarrow \ln 3 = .08t \rightarrow \frac{\ln 3}{.08} = \frac{.08t}{.08} = \frac{13.7}{\text{yrs}}$

(B) 56) a) $y = \frac{5}{x}$ b) ~~$y = \frac{x}{2}$~~ c) $x = \frac{2}{y}$ d) $y = \frac{2}{x}$

(D) 57) $\frac{5(x+1)}{(x+1)(x-1)} + \frac{x}{(x+1)(x-1)} = \frac{1(x+1)}{(x-1)(x+1)} \rightarrow 5x+5+x = x+1$
 $5x = 4$
 $x = \frac{4}{5}$

(D) 58) $\bar{x} = 75$ $\sigma = 2.5$ $75 + 2(2.5) = 80\%$

