~~2/5/21 Extra Practice Answers~~ Quiz Review 2.6-2.9

16) $1+\log x$

17) $\ln x+\ln y-\ln z$

18) $4\log_b x-2\log_b z$

19) $1+2\log_4 x$

20) $\frac{1}{2}\log_3(x-2)$

21) $(5\ln x+2\ln z)-3\ln y$

22) $\frac{1}{2}(\ln 3+\ln x)-\ln 7$

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23) $\log\frac{7}{x}$

24) $\ln\frac{x^3y^2}{z^4}$

25) $\ln x^3$

26) $\log_2\frac{5x}{3}$

27) $\log_4 4x^3$

28) $\ln 64x^5$

29) $\log_5\frac{\sqrt{7}}{x^2}$

Problem 1

$2^{2(3x+5)}=2^{3(4x-8)}$

$6x+10=12x-9$

$19=6x$

$\frac{19}{6}=x$

Problem 2

$e^{8-3x}=268$

$8-3x=\ln 268$

$8-3x=5.591$

$-3x=-2.409$

$x=.803$

Problem 3

$5^{6x+7}=761$

$\log_5 761=6x+7$

$4.122=6x+7$

$-2.878=6x$

$-.4796=x$

Problem 4

$3^{3(2x+8)}=3^{-3(3x+1)}$

$6x+4=-9x-3$

$12=3x$

$4=x$

Problem 5

$3^{2x+5}=87$

$\log_3 3^{2x+5}=\log_3 87$

$2x+5=\log_3 87$

$2x+5=4.065$

$x=.4675$

Problem 6

$e^{3x-5}=\frac{195}{4}$

$3x-5=\ln\frac{195}{4}$

$3x-5=3.887$

$x=2.962$

Quiz Review 2.6 - 2.9

Problem 1: Solve: $\log_5(4x+11)=2$ → $\log_5(4x+11)=\log_5 5^2$

$4x+11=25$

$4x=14$

$x=\frac{14}{4}=\frac{7}{2}$

Problem 2: Solve: $\log_2(x+5)-\log_2(2x-1)=5$ → $\log_2 2^5$

$\frac{x+5}{2x-1}=32$

$x+5-32(2x-1)=0$

$x+5-64x+32$ →

$-63x+37=0$

$-63x=-37$

$x=\frac{37}{63}$

Problem 3: Solve: $\log_8 x+\log_8(x+6)=\log_8(5x+12)$

$x(x+6)=5x+12$

$x^2+6x=5x+12$

$x^2+x-12=0$

$(x+4)(x-3)$

$x=-4$ → extraneous

$x=3$ → real

Problem 4: Solve: $\log_6 x+\log_6(x-9)=2$ → $\log_6 6^2$

$x(x-9)=36$

$x^2-9x=36$

$x^2-9x-36=0$

$(x-12)(x+3)$

$x=12$ → real

$x=-3$ → extraneous

Problem 5: Solve: $\ln(6x-5)=3$

$6x-5=e^3$

$x=4.1809$

Problem 6: Solve: $\log_4(3x-2)-\log_4(4x+1)=2$ → $\log_4 4^2$

$\frac{3x-2}{4x+1}=16$

$3x-2-16(4x+1)=0$

$3x-2-64x-16$ →

$-61x-18=0$

$x=\frac{-18}{61}$ → extraneous

Problem 7: Solve: $\log_3(x^2-6x)=3$ → $\log_3 3^3$

$x^2-6x-27=0$

$(x+3)(x-9)$

$x=-3, 9$ both real