LOGARITHMIC AND EXPONENTIAL EQUATIONS

Exercise 1: Work out:

a) $\log_2(x+3)=3$

b) $\log_5(3x+1)=2$

c) $\log_2(1-x)=4$

d) $\log_3(x-2)=-1$

e) $2\log(x-5)=3$

Exercise 2: Work out:

a) $\log x+\log 20=3$

b) $\log_8(x+5)-\log_8(x-2)=1$

c) $\log x+\log(x+1)=\log 12$

d) $\log(x+4)=1-\log(x-5)$

e) $\log x-1=\log(22-x)$

Exercise 3: Work out:

a) $2\log_2(x-1)=\log_2(3x+1)$

b) $\log x+\log(x+3)=2\log(x+1)$

c) $2\log_2(x-1)=\log_2(x-3)+\log_2(2x-2)$

d) $\log x^3=\log 6+2\log x$

e) $2\log x=\log(x-16)+2$

f) $3\log x-\log 32=\log\frac{x}{2}$

g) $2\log x+2=\log(4x)$

h) $2\log x-2\log(x+1)=0$

Exercise 4: Work out:

a) $\log(x+5)+\log(4x-10)=3$

b) $\log(3x+5)-\log(2x+1)=\log 6-\log x$

c) $\ln(x-3)+\ln(x+1)=\ln 3+\ln(x-1)$

d) $\log 2+\log(x-3)=\log(\sqrt{2x})$

Exercise 5: Work out:

a) $5^{x-1}=125$

b) $5^{2x+7}=32$

c) $4^{2x}=\sqrt[4]{128}$

d) $9^{5x-2}=\sqrt[5]{27}$

e) $2^{7x+9}=\frac{1}{8}$

f) $3^{x^2-14}=\frac{1}{243}$

g) $8^{7-4x}=\frac{1}{64}$

Exercise 6: Work out:

a) $3^{5-2x}=9^{x}$

b) $7^{x^2-10x+9}=1$

c) $2^{1-3x}=4^{2x-3}$

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

e) $4^{x+3}=\frac{1}{2^{x}}$

Exercise 7: Work out:

a) $7^{x}=14$

b) $3^{2x}=5$

c) $5^{x+1}=2$

d) $3^{x-2}=5^{x}$

e) $4^{x-5}=7^{2-x}$

f) $5^{1-x}=2^{3x+7}$

Exercise 8: Work out:

a) $2^{x}+2^{x+1}=24$

b) $3^{x}+3^{x+1}+3^{x+2}=39$

c) $2^{x+3}-2^{x+2}-2^{x+1}=64$

d) $3^{x}+3^{x-1}+3^{x-2}=13$

e) $2^{x+1}+2^{x}+2^{x-1}=224$

Exercise 9: Work out:

a) $3^{2x}-2\cdot3^{x}-3=0$

b) $2^{2x}+6=5\cdot2^{x}$

c) $4^{x}+16=10\cdot2^{x}$

d) $9^{x}+18=11\cdot3^{x}$