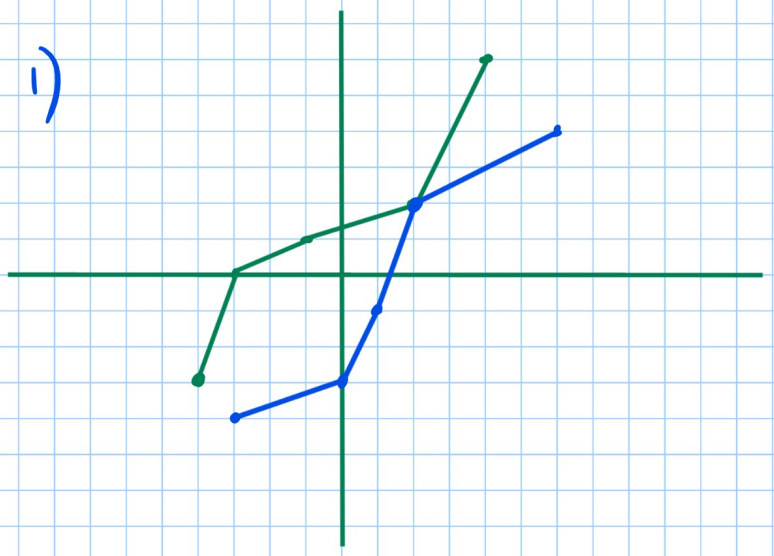
# ANSWERS FOR REVIEW

1)



2) $f(x) = 8x - 9$

$g(x) = \frac{x+9}{8}$

$f(g(x)) = 8\left(\frac{x+9}{8}\right) - 9 = x + 9 - 9 = x$

$g(f(x)) = \frac{8x - 9 + 9}{8} = \frac{8x}{8} = x$

3) $f(x) = 5 - \frac{4}{7}x$

$y = 5 - \frac{4}{7}x$

$7\left(x = 5 - \frac{4}{7}y\right)$

$7x = 35 - 4y$

$7x - 35 = -4y$

$\frac{7x-35}{-4} = y$

$f^{-1}(x) = \frac{7x-35}{-4}$

or

$\frac{35-7x}{4}$

or $-\frac{7}{4}x + \frac{35}{4}$

4) a) $6^{3+4x} = \frac{1}{36}$

$6^{3+4x} = \frac{1}{6^2}$

$6^{3+4x} = 6^{-2}$

$3+4x = -2$

$4x = -5$

$x = -\frac{5}{4}$

b) $16^{x} = 8$

$2^{4x} = 2^{3}$

$4x = 3$

$x = \frac{3}{4}$

5) $\log_B 13 = y$

$B^{y} = 13$

$10^{14x} = K$

$\log_{10} K = 14x$

or $\log K = 14x$

6) a) $\log_9 \frac{1}{81} = x$

$9^{x} = \frac{1}{81}$

$9^{x} = \frac{1}{9^2}$

$x = -2$

b) $\log_{16} 4 = x$

$16^{x} = 4$

$4^{2x} = 4^{1}$

$2x = 1$

$x = \frac{1}{2}$

7) a) $\log_8 (5x-1) = 2$

$8^2 = 5x-1$

$64 = 5x-1$

$65 = 5x$

$x = 13$

b) $\log_3 x = -3$

$3^{-3} = x$

$x = \frac{1}{3^3}$

$x = \frac{1}{27}$

c) $\frac{7 \cdot 5^{3x}}{7} = \frac{28}{7}$

$5^{3x} = 4$

$\ln 5^{3x} = \ln 4$

$\frac{3x \ln 5}{3 \ln 5} = \frac{\ln 4}{(3 \ln 5)}$

$x = 0.287$

ln(4)/(3 ln(5)) enter

d) $5^{1+3x} = 6^{2x}$

$\ln 5^{1+3x} = \ln 6^{2x}$

$(1+3x)\ln 5 = 2x \cdot \ln 6$

$(1+3x)1.61 = 2x \cdot 1.79$

$1.61 + 4.83x = 3.58x$

$-4.83x \quad -4.83x$

$\frac{1.61}{-1.25} = \frac{-1.25x}{-1.25}$

$x = -1.29$

8) a) $\ln \frac{4x^5}{y^7} = \ln 4x^5 - \ln y^7$

$= \ln 4 + \ln x^5 - \ln y^7$

$= \ln 4 + 5\ln x - 7\ln y$

b) $\log (x^7 (x+6)^4) = \log x^7 + \log (x+6)^4$

$= 7\log x + 4\log (x+6)$

a) $8\log x + 6\log y - 3\log 5$

$\log x^8 + \log y^6 - \log 5^3$

$\log \frac{x^8 y^6}{5^3}$

$\log \frac{x^8 y^6}{125}$

~~$\frac{\log x^8 y^6}{\log 5^3}$~~

$b^{\frac{1}{n}} = \sqrt[n]{b}$

b) $4\ln(x+3) - \frac{1}{3}\ln x$

$\ln(x+3)^4 - \ln x^{\frac{1}{3}}$

$\ln \frac{(x+3)^4}{x^{\frac{1}{3}}}$ OR $\ln \frac{(x+3)^4}{\sqrt[3]{x}}$

9) i) $A = 15e^{kt}$

$23 = 15e^{k \cdot 2}$

$1.53 = e^{2k}$

$\frac{\ln 1.53}{2} = \frac{2k}{2}$

$k = 0.213$

$A = 15e^{0.213t}$

In 2023, $t = 12$

$A = 15e^{0.213 \cdot 12}$

$A = 193$ cougars

ii) 16 days $\quad k = \frac{\ln 0.5}{16} = -.0433$ $\quad k = \frac{\ln 0.5}{\text{half-life}}$

$A = A_0 e^{kt}$

$A = 23e^{kt}$

$A = 23e^{-.0433t}$

$A = 23e^{-.0433 \cdot 30}$

$A = 6.27$ grams

iii) $P = 45000$

$r = .07$

$t = 10$ yrs

a) quarterly

$A = P\left(1 + \frac{r}{n}\right)^{nt}$

$A = 45000\left(1 + \frac{.07}{4}\right)^{(4 \cdot 10)}$

$A = \$90,071.88$

b) continuously

$A = Pe^{rt}$

$A = 45000e^{(.07 \cdot 10)}$

$A = \$90,618.87$

iv) $r = .045$

$n = 12$

$F = 8500$

$t = 9$

$8500 = P\left(1 + \frac{.045}{12}\right)^{(12 \cdot 9)}$

$8500 = P \cdot 1.498167236$

$P = \$5673.60$