1. i) $6^{-2} = \frac{1}{6^2}$

$= 1/36$

i = E

ii) $(-2)^{-5} = \frac{1}{(-2)^5}$

$= -\frac{1}{32}$

ii) = F

iii) $5^0 = 1$

iii) = A.

iv) $(-3^2)^{-2}$.

$(-3^2) = 9$.

9^{-2}.

$\frac{1}{9^2} = \frac{1}{81}$

iv) = B

v) $\left(\frac{3}{4}\right)^{-2}$

$\frac{1}{(3/4)^2}$.

$\frac{1}{9/16} = \frac{16}{9}$

v = D

vi) $(4^{-1})^{-3}$

$= 4^{(-1\times-3)}$

$= (4)^3$

$= 64$

vi) = C

2. Evaluate/simplify :-

a) $\left(\frac{125}{8}\right)^{1/3}$

$125^{1/3} = 5$

$8^{1/3} = 2$

$= \frac{5}{2}$

b) $\left(\frac{1}{32}\right)^{2/5}$

$1^{2/5} = 1^{1/5} = 1^2 = 1$

$32^{2/5} = 32^{1/5} = 2^2 = 4$

$= \frac{1}{4}$

c) $(4b^4)^{1/2}$.

$(4 \times b^4)^{1/2}$

$(4^{1/2})(b^{4\times1/2}) = (2)(b^2) = 2b^2$

3. Indicate Linear, Quadratic / exponential (E, Q, L)

a) $f(x) = 3(3)^x$. Exponential

b) $g(x) = 3x + 4$ Linear

c) $h(x) = 3x^2 + 4$ Quadratic

4. Complete the chart and graph $y = 4^x$

x	y	1st Diff
-1	1/4	
0	1	3/4
1	4	3
2	16	12

2nd diff.

common ratio

4
4
4

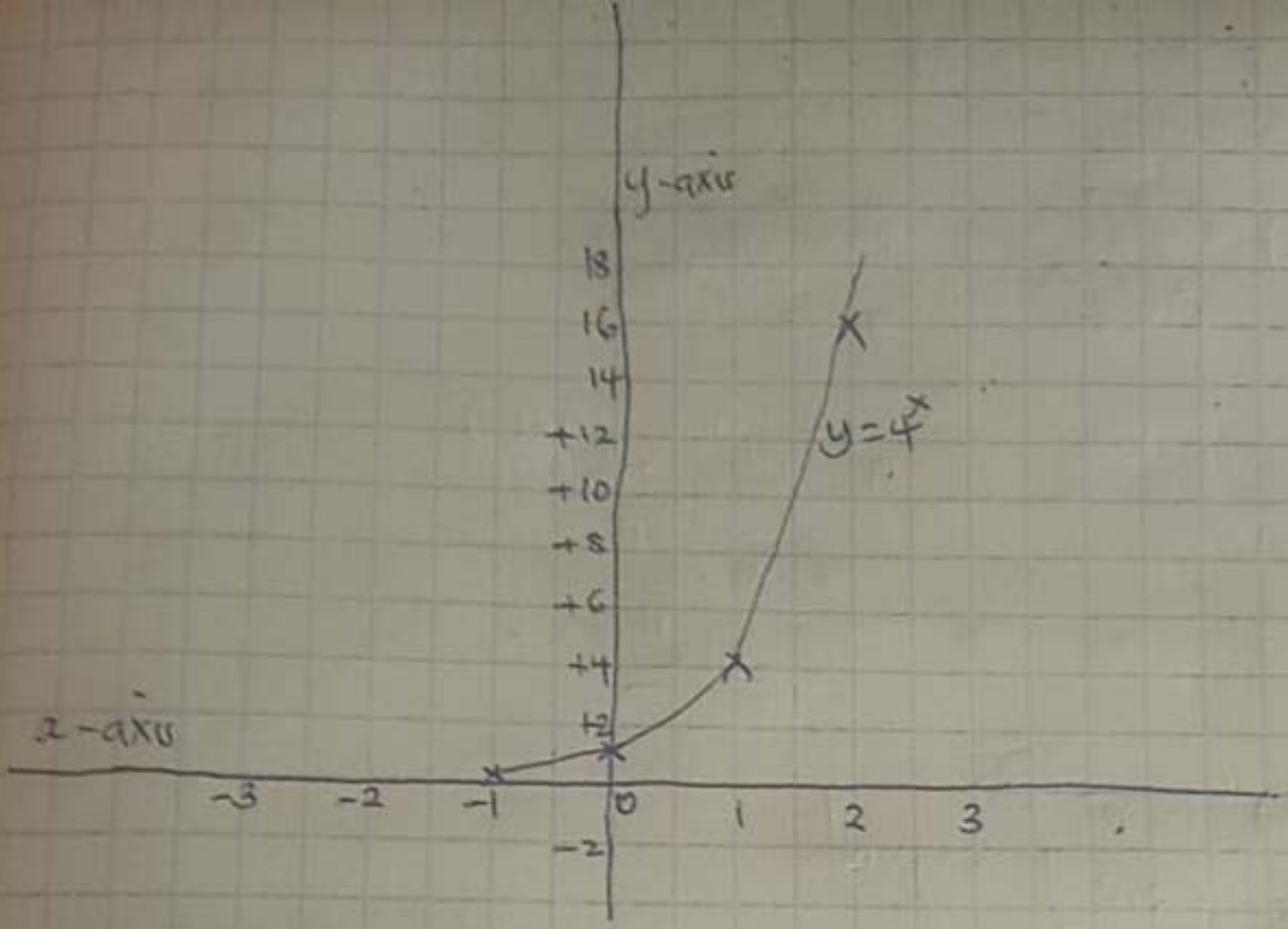
$y = 4^x$

$4^{-1} = \frac{1}{4^1} = 1/4$

$4^0 = 1$

$4^1 = 4$

$4^2 = 16$



a) y-intercept (point): at $y = 4^x = x = 0$

$=$ y-intercept $(0,1)$

b) Horizontal asymptote equation: $y=0$.

c) Domain: $D: (-\infty, \infty)$

d) Range: $R: (0, \infty)$

5. Simplify :-

a) $\frac{a^3 b^4 c^7}{a^2 b^3 c^{-2}}$ $\frac{a^3 \cdot b^4 \cdot c^7}{a^2 \cdot b^3 \cdot c^{-2}}$

$a^{3-2} \cdot b^{4-3} \cdot c^{9-(-2)}$

$a^1 \cdot b^1 \cdot c^{11}$

$= abc^{11}$

b) $\left[\frac{3m^2}{2n^3}\right]^2$ expand.

$\frac{3^2 \cdot m^{2\times 2}}{2^2 \cdot n^{3\times 2}} = \frac{9m^4}{4n^6}$

c) $(a^5)(a)^2$

$a^5 \cdot a^2$

a^{5+2}

$= a^7$

6. a) write an exponential function:

$P(t) = P_0(1-d)^{(t/2)}$ $P_0 - 580$ - initial value

$= 580(1-0.05)$ $- 5/1000$ - decay rate.

$y = 580(1-0.05)^x$ time - 2 years.

$t/2$ - exponent $2/2 = 1$

$y = 580 \cdot 0.95^x$

b) $y = 580 \cdot (0.95)^7$. $t/2 = 9t/14 = 7$ years

$= 405$ deers.

7. How would the shape of the graph $y = (\frac{1}{3})^x$ compare with the shape of the graph $y = 3^x$

Difference - $\frac{1}{3}x$ - increases towards negative x while $3x$ increases towards positive x

Similarities - They both have $y=0$ as asymptote equation.

~~They both are positive~~

They both have $x=0$ y-interception.

8a) $A = A_0(1-g)^t$

$v(t) = 500(1+0.07)^t$.

$v(t)$ = value after each year.

500 = the initial value

$(+g)$ - the rate of growth - 0.07.

t - time available.

b) $v(t) = 500(1+0.07)^{20}$ - 20 years.

$= 500(1.07)^{20}$

$= \$1935$

c) double $\Rightarrow \$1000 = 500(1+0.07)^x - 500$.

$\frac{2}{500} = 1.07^x$

$2 = 1.07^x$

$x = 11$ years.

11. Let the size of water lilies be 1 at day 1 :-

day 2 $\Rightarrow 1 \times 2 =$

day 3 $\Rightarrow (2) \times 2 = 4$.

day 4 $(4) \times 2 = 8$

at 29th day = $\overset{28}{2}$

(268435456)

Therefore day 30 = $(268435456) \times 2$.

So day 29th will be half lilies in the pool.

9. $3^t = 1/27$. find t.

$= 1/27 \quad \frac{1}{3^3} = 3^{-3}$.

$3^t \cdot 3^{-3}$

$3^t = 3^{-3}$

$t = -3$

10. Explain - Each year the trees grows $1/2 x$.

x - initial growth.

$y = 2 + 2\left(\frac{1}{2}\right)^t$

- The tree grows half of the previous year and the tree will be 5m

$5 - 2 = 2^{-2} + 2(1/2)^{t-2}$

$5 = 2^t$

$\frac{5}{2} = \frac{2(1/2)^t}{2}$

$1/2^t = 1.5$