

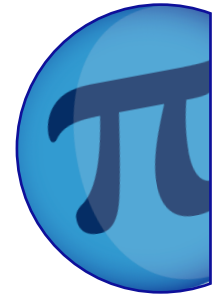


# The Emperor's Chess Board

NAME: .....

CLASS: .....

DATE: .....



## Basic

1) Find the value of the following:

a)  $2^2$

b)  $7^2$

c)  $2^3$

d)  $3^3$

e)  $3^4$

f)  $2^5$

g)  $2^8$

h)  $3^8$

2) Use index laws to answer the following:

a)  $a^5 \times a^3 =$

b)  $c^7 \times c^{-2} =$

c)  $3m^3 \times 2m^2 =$

d)  $a^4 \div a^2 =$

e)  $g^{-2} \div g^{-6} =$

f)  $18p^{-6} \div 6p^{-6} =$

3) How many square bathroom tiles of length 4cm would be needed to tile a bathroom wall which is a square with a length of 1m?



# The Emperor's Chess Board

NAME: .....

CLASS: .....

DATE: .....



## Core

1) Evaluate the following:

a)  $2^5$

b)  $3^8$

c)  $7^3$

d)  $3^4$

2) Use index laws to find the answers to the following:

a)  $6d^3 \times 7d^2 =$

b)  $20h \times 5h^2 =$

c)  $3m^5 \times 5m^7 =$

d)  $25g^5 \div 5g^3 =$

e)  $63f^9 \div 9f^2 =$

f)  $144y^2 \div 12y^2 =$

3) Evaluate:

a)  $4^t$  when  $t = 1.5$

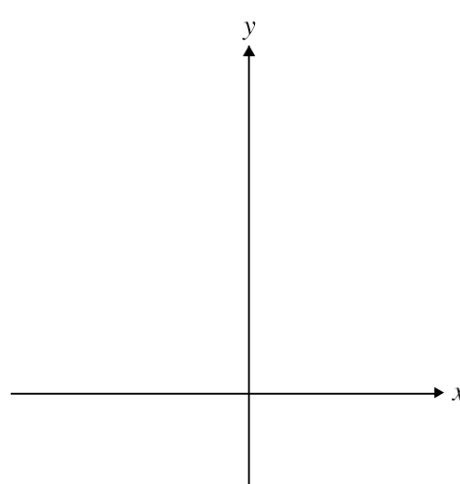
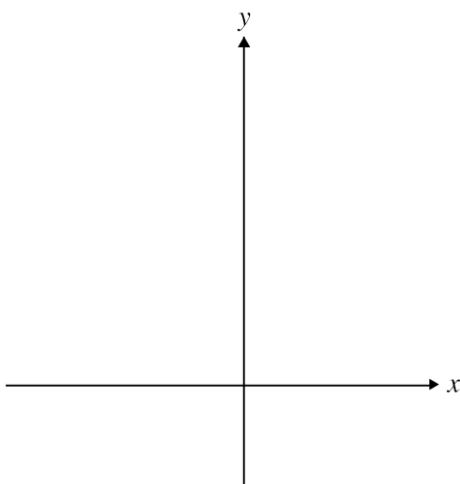
b)  $6^{-x}$  when  $x = 4$

c)  $2.4^{3t}$  when  $t = 0.4$

4) Draw the graph of:

a)  $y = a^x, a > 1$

b)  $y = a^x, 0 < a < 1$



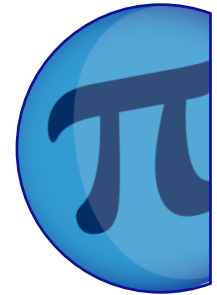


# The Emperor's Chess Board

NAME: .....

CLASS: .....

DATE: .....



## Advanced

1) Evaluate the following:

a)  $\frac{4m^3 \times 2m^4}{2m^2}$

b)  $\frac{5n^{-2} \times 8n^5}{10n^{-3}}$

c)  $\frac{24n^9}{2n^3 \times 4n^{-1}}$

2) Evaluate the following:

a)  $(2v^2)^3$

b)  $(3n^{-3})^2$

c)  $(a^4)^{-8}$

d)  $(p^{-6})^{-9}$

3) Write the next three terms of the following geometric series:

a)  $1 + 3 + 9 + 27 + 81 +$

b)  $5 - 10 + 20 - 40 +$

4) For the geometric series  $8 + 4 + 2 + 1 + 0.5$ , find the sum of the first 10 terms and then find the sum to infinity.



# The Emperor's Chess Board

## ANSWERS

### Basic

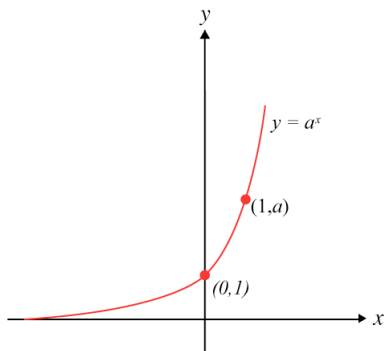
- 1) a) 4                      b) 49                      c) 8                      d) 27  
e) 81                      f) 32                      g) 256                      h) 6561
- 2) a)  $a^8$                       b)  $c^5$                       c)  $6m^5$                       d)  $a^2$   
e)  $g^4$                       f)  $3p^0 = 3$

3) 625 tiles

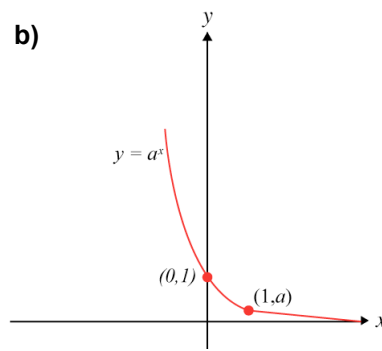
### Core

- 1) a) 32                      b) 6561                      c) 343                      d) 81
- 2) a)  $42d^{-1}$                       b)  $100h^3$                       c)  $15m^{12}$                       d)  $5g^2$   
e)  $7f^7$                       f)  $12y^0 = 12$
- 3) a) 8                      b)  $\frac{1}{1296}$                       c) 2.86 (2dp)

4)



b)



### Advanced

- 1) a)  $4m^5$                       b)  $4n^6$                       c)  $3n^7$
- 2) a)  $8v^6$                       b)  $9n^{-6}$                       c)  $a^{-32}$                       d)  $p^{54}$
- 3) a)  $243 + 729 + 2187$                       b)  $80 - 160 + 320$



# The Emperor's Chess Board

## ANSWERS

### Advanced

$$4) a = 8; r = \frac{1}{2}$$

$$S_n = \frac{a(1-r^n)}{1-r} = \frac{8 * (1 - \frac{1}{1024})}{\frac{1}{2}}$$

$$S = \frac{a}{1-r} = \frac{8}{1 - \frac{1}{2}} = S_\infty = 16$$

$$S_{10} = 15.984375$$