Exponentials

- Example 2:
- The population of a form of algae is believed to grow exponentially.
- On day 1 the population of algae was 2240
- By day 4 it increased to 35000.
- Calculate the population of the algae by day 10.

Ex 1 Day 1 Population 2240

Day 4 35000 Day 10 ?

Initial population $P = 2240$

Day 4 $P \times r^3 = Pr^3 = 35000$

$\Rightarrow r^3 = \frac{35000}{2240} = 15.625$

$\Rightarrow r = \sqrt[3]{15.625} = 15.625^{\frac{1}{3}}$

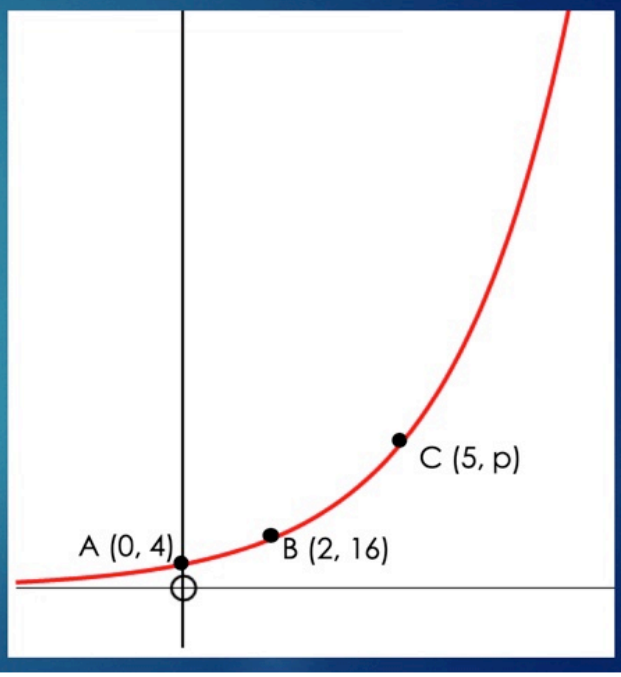
$r = 2.5$

Day 10 $= P \times r^9 = 2240 \times 2.5^9$

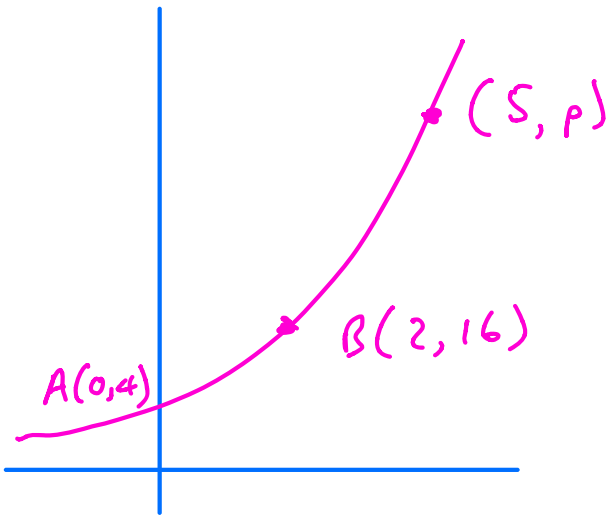
$= 8{,}544{,}922$

Exponentials – Graphs

- Example:
- The diagram on the right shows the curve of $y = ab^x$
- It passes through the points A (0, 4), B (2, 16) and C (5, p)
- Find the value of p.



Ex 2



Find p

$y = ab^x$

$(0,4)$ $\quad 4 = ab^0$

$4 = a$

$y = 4b^x$

$(2,16)$ $\quad 16 = 4 \times b^2$

$4 = b^2$

$\Rightarrow \quad b = 2$

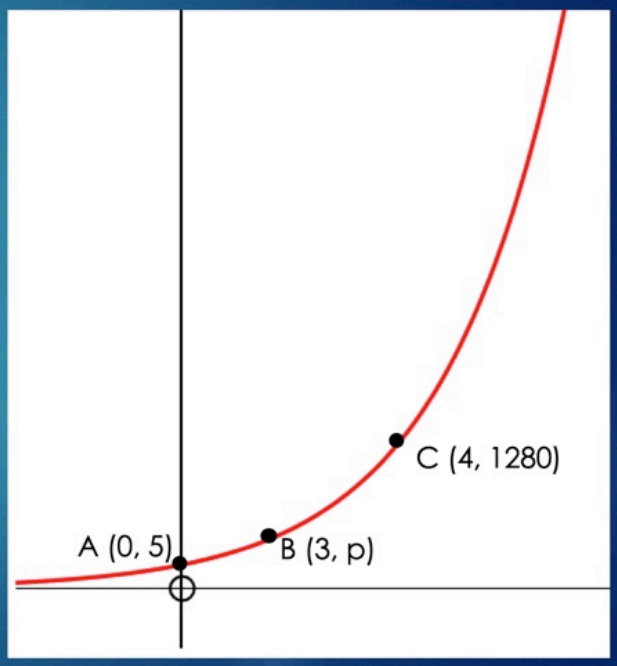
$y = 4 \times 2^x$

$(5,p)$ $\quad p = 4 \times 2^5$

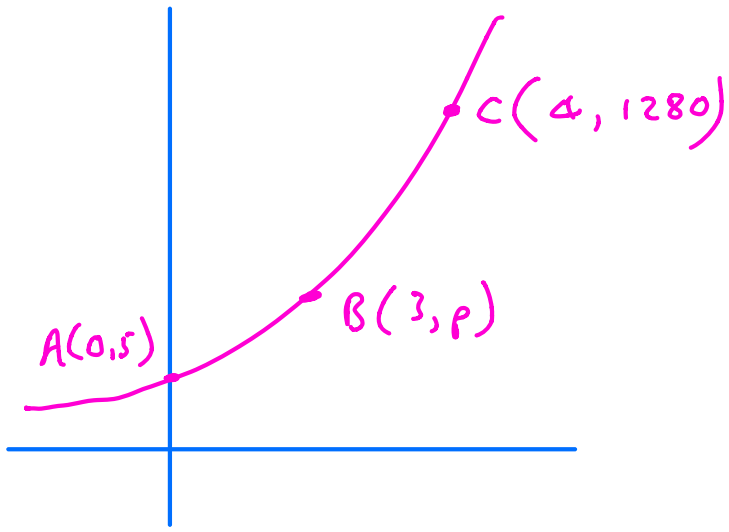
$p = 128$

Exponentials

- The diagram on the right shows the curve of $y = ab^x$
- It passes through the points A (0, 5), B (3, p) and C (4, 1280)
- Find the value of p.



Ex 3



$y = ab^x$

$(0,5)$ $\quad 5 = ab^0$

$5 = a$

$(4, 1280)$ $\quad 1280 = 5 \times b^4$

$\frac{1280}{5} = b^4$

$256 = b^4$

$b = 256^{\frac{1}{4}}$

$b = 4$

$y = 5 \times 4^x$

$(3, p)$ $\quad p = 5 \times 4^3$

$p = 320$