

1. The value of a car decreases each year. This value can be calculated using the function $P(t) = 32\,000r^t$ where $P(t)$ is the value of the car in USD, t is the number of years after it was first bought $t \geq 0$ and r is a constant $0 < r < 1$.
- (a) (i) Write down the value of the car when it was first bought.
- (ii) One year later the value of the car was 27 200 USD. Find the value of r .
- (b) Find how many years it will take for the value of the car to be less than 8000 USD

Answers:

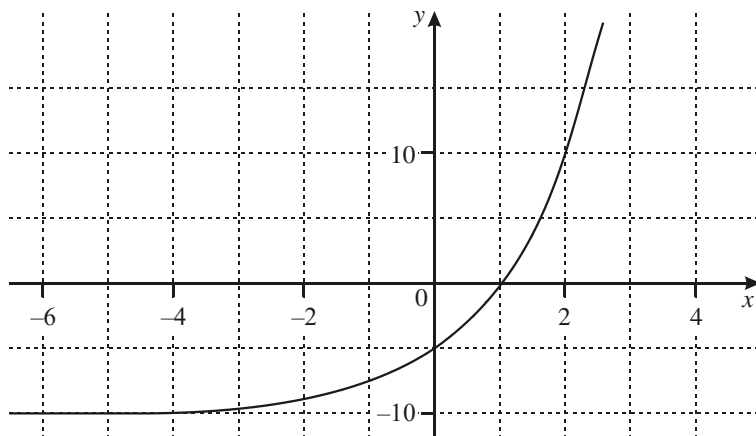
(a) (i).....

(ii).....

(b)

(Total 6 marks)

2. The graph below shows the curve $y = k(2^x) + c$, where k and c are constants. Find the values of c and k .



Answers:

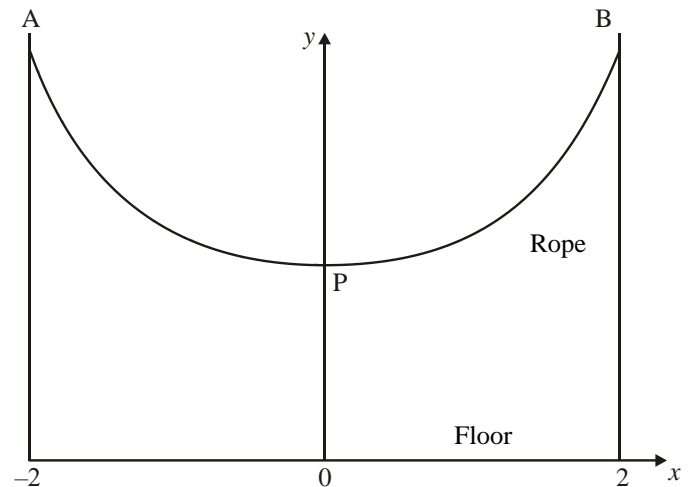
$c =$

$k =$

(Total 4 marks)

3. The illustration below shows a rope between two clips A and B. The points A and B are at equal heights above the ground. P is the lowest point on the rope. The floor is represented by the x -axis. The x -coordinate of A is -2 and the x -coordinate of B is 2 . Point P is on the y -axis. The shape of the rope is given by $y = 2^x + 2^{-x}$ where $-2 \leq x \leq 2$.

- Find the coordinate point A.
- Find the coordinate point B.
- Calculate the height of the point P.
- Find the range of y . inequality symbols.



Answers:

-
-
-
-

[Total 9 marks]

4. The function $f(x) = p \cdot 0.4^x + q$ is such that $f(-1) = 15.25$ and $f(1) = 4.12$

- Find the value of p .
- Find the value of q .
- Find the y -intercept
- State the equation of the horizontal asymptote, if any.

Answers:

-
-
-
-

[Total 8 marks]