3. MATHS

QUESTION

Over all real numbers, find the minimum value of positive real number, y such that

SOLUTION

eqn 1

let *y1* = eqn 2

*y2* =eqn 3

Hence

*y = y1 + y2* eqn 4

At turning point

From eqn 2

*y1* =

let *u* = = 2 (*x* + 6)

*y1*= =

= () ()

= (2 (*x* + 6) ) (*u*-1/2/2) = (*x* + 6) ((*x* + 6)2 + 25)-1/2

Hence

= eqn 5

Also from eqn 3

*y2* =

let *u* = = 2(*x* - 6)

*y2* = =

= ()

= (2 (*x* - 6)) (*u*-1/2/2) = (*x* - 6) ((*x* - 6)2 + 121)-1/2

Hence

= eqn 6

Therefore:

=

At turning point = 0

Hence:

= 0

= 0

Cross Multiplying:

= 0

Squaring both sides:

Solving with quadratic formula:

*a* = 96 *b* = 1752 *c* = 3456

= and =

= and =

Hence:

*x* = or *x =*

Substituting x into eqn 1 to get y

When *x* =;

When *x* = - 16;

Hence

The minimum Value is