

MAX - min PROBLEMS

1. The sum of two natural numbers is 12. Find the numbers if their product is a *maximum*.
2. Two numbers have a difference of 8. Find the numbers if their product is a *minimum*.
3. The sum of two numbers is 16. Find the numbers if the sum of their squares is a *minimum*.
4. Two numbers have a difference of 16. Find the numbers if the result of adding their sum and their product is a *minimum*.
5. Find the number which exceeds its square by the *greatest* possible amount.
6. A flare is projected upwards with a velocity of 60m/s. The function that relates the height of the flare in metres to the time in seconds is:
$$h(t) = -5t^2 + 60t + 2$$
Determine the *maximum* height the flare reaches, and the time at which it reaches that height.
7. The height of a Tiger Woods drive can be obtained by the function:
$$h(t) = -\frac{1}{4}t^2 + 2t + 26$$
where h is the height in metres and t is the time in seconds. Determine the *maximum* height of Tiger's drive, and the time at which it reaches that height.
8. A lifeguard marks off a rectangular swimming area at a beach with 200m of rope. What is the *greatest* area she can enclose?
9. A rectangular area is enclosed by a fence and divided by another section of fence which is parallel to two of its sides. If the 600m of fence used encloses a *maximum* area, what are the dimensions of the enclosure?
10. What is the *maximum* area of a triangle whose sum of its base and height is 15cm.
11. A theatre which seats 2000 people charges \$10/ticket and always sells out. A survey indicates that if the ticket price is increased, the number sold will decrease by 100 for every dollar of increase. What ticket price would result in the *greatest* revenue?
12. A bus company carries about 20,000 riders per day at a fare of \$0.90. A survey indicates that if the fare is decreased, the number of riders will increase by 2000 for every \$0.05 of decrease. What fare would result in the *greatest* revenue?