

Give exact answers in radicals, or fractions; no decimal approximations.

- _____ 1. If 3 minus the reciprocal of $3 - x$ equals reciprocal of $x + 3$, what is x ?
- _____ 2. What is the maximum value of the product xy if $x + 2y = 100$?
- _____ 3. For what real value of x is $4x - 8\sqrt{x} + 3 = 0$?
- _____ 4. How many square units are in the area of the triangle whose vertices are the x - and y - intercepts of the curve $y = x^3 + 4x^2 - 11x + 6$
- _____ 5. A regular hexagon has area $36\sqrt{3}$ square cm. On each side of this hexagon, an equilateral triangle is constructed. What is the total area of the resulting shape?
- _____ 6. Simplify: $(2x+3)^4 + 4(2x+3)^3 + 6(2x+3)^2 + 4(2x+3) + 1$.
- _____ 7. The base b representation of a number is 24 and the base b of its square is 554. If $b > 0$, find base 10 representation of b .
- _____ 8. What is the largest positive integer n such that $n!$ divides 624?
- _____ 9. Solve for x the equation : $\log_3(\log_2(2x+1)) = 2$.
- _____ 10. Find how many integers between 1 and 380 are divisible by all the numbers 3, 4 and 5.
- _____ 11. The sum of all but one angle of a convex polygon is 2570° . find the remaining angle.