1) a. Find the vertex of the parabola: $y = 2x^2 - 6x + 7$

b. Find the AREA of the circle whose equation is: $x^2 - 8x + y^2 - 6y - 11 = 0$
(Looks like a chance to complete the square.)

2) Given that the roots of the polynomial P(x) = $x^3 + 4x^2 - 3x + 7$ are r_1,r_2 and r_3, find:

a. $r_1 + r_2 + r_3$ b. $r_1r_2 + r_1r_3 + r_2r_3$

c. $r_1r_2r_3$ d. $\frac{1}{r_1r_2} + \frac{1}{r_1r_3} + \frac{1}{r_2r_3}$

3) Find x and simplify the result: (Write an exact value without use of logs)

a. $x = \log_{2\sqrt{3}} 144$

b. $x = \log_3 \sqrt[4]{729\sqrt[3]{27^{\frac{2}{3}}}}$

c. $\log(x) + \log(3x + 29) = 1$

4) State the polynomial function of lowest degree with zeros -2, 1, and 5 , containing (2, 36).

5) $g(x) = x^2 - 3x + 5$

a. Substitute and simplify the expression: $\frac{g(x+h) - g(x)}{h}$

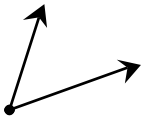
b. Explain what happens to the expression when , h , gets "very" close to 0.

6) Solve the equation: $2 + \frac{3}{5^x - 2} = 4$

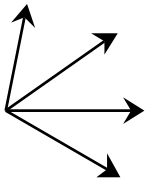
Give *x* to 4 significant digits.

7)

Given 2 (non-opposite) rays with a common endpoint, 1 angle is determined.

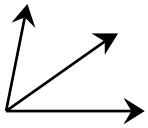


Given 4 rays (no two opposite) with a common endpoint, 6 angles are determined.

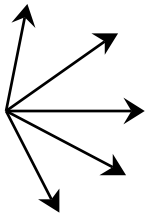


How many angles are formed by:

a) 3 such rays?



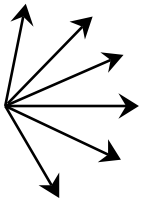
b) 5 such rays?



c) 6 such rays?

d) 100 such rays?

e) n such rays?



8) Find the *x*-intercepts of the graph of: $y = (x+2)^3(2x-1)^2 + (x+2)^2(2x-1)^3$.

9) Two of the roots of the polynomial equation: $x^3 - 8x^2 + ax + b = 0$ are 5 and 2.

a. Find the third root.

b. Find (a,b).

10) Given that $y = f(x)$ is a function whose domain is [–6,2] and range is [–3,6], what is the domain and range of each of the following functions?

a. $g(x) = 3f(-x)$ b. $i(x) = -2f(3x)$

c. $h(x) = f(x+3)$ d. $j(x) = |f(x)| - 2$

11) Given $f(x) = \log_2 x^3 + 1$, where $x \geq 0$

a. Find an expression for $f^{-1}(x)$

b. Find the domain and range of both $f(x)$ and $f^{-1}(x)$.

12) Given that $p = \log_b 3$, $q = \log_b 6$, and $r = \log_b 10$, write the following in terms of *p* ,*q*, and *r*:

a. $\log_b 12$

b. $\log_b 0.3b^2$

c. $\log_b 0.25$

13) The zeros of a polynomial $h(x)$ are –1/4, - 2/3, 3+2i, 3-2i , and 3:

a. Write $h(x)$ in factored form using integers only

b. Use your calculator (expand command under algegra menu) to write $h(x)$ in expanded form.

14) Use the features of a TI-89 calculator to do the following.

a. Factor completely: $x^3 + 2x^2 + 21x - 58$

b. Find the zeros of: $f(x) = x^3 + 2x^2 + 21x - 58$

c. All values of *x* such that $f(x) = x^3 + 2x^2 + 21x - 58$ is greater than 500. (Two decimal places)