1. The function $f(x) = -x^2 - 4ax + b^2 + 5a^2$ has a maximum value of $2b^2 + 4a - 4$, where a and b are constants.
   a. By using completing the square, show that b=3a-2
   b. Calculate the values of a and b if the graph of function $f(x)$ is symmetrical about line x =3

2. A quadratic function is defined by $f(x) = (x - 3)(x + 1) - 2x - 2$. Find the maximum or minimum value of the function $f(x)$. Hence, sketch the graph $f(x)$.

3. Find range of values of h if $(2h + 4)(h - 3) > 4h - 4$

4. A quadratic function is defined by $f(x) = 2x^2 - 6x + 8$
   a. Express $f(x)$ in the form of $a(x + p)^2 + q$, whee a,p and q are constants
   b. Determine the maximum or minimum value of $f(x)$
   c. Sketch the graph of function $f(x)$

5. Given the quadratic function $f(x) = 6x - 3x^2 - 8 = q + a(x + p)^2$
   a. Find the values of a,p and q
   b. Sketch the graph of $f(x)$ for $-2 \leq x \leq 3$
   c. State the range of $f(x)$ for given domain

6. The diagram below shows the graph of the quadratic function $f(x) = |a(x + 1)^2 + b|$. The maximum point of the quadratic function is (-1,9). Find
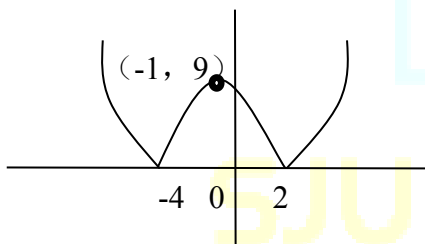

   a. The values of a and b
   b. The range of $f(x)$ for the domain $-5 \leq x \leq -2$

7. a. Find the range of values of x if $5x^2 + 6 \geq 17x$
   b. Given that $f: x \rightarrow (2x + 1)(2x - 3)$, find the values of h if $f(h) > 7h$

8. a. Find the range of values of x if $5x \leq 2x^2 - 12$
   b. Given that the straight line y = 2x-5 and the curve $3x^2 - 11x + k = 0$ do not intersect show that $k > 19\frac{1}{12}$

9. Find the maximum or minimum value of y if $y + 4x = 2x^2 + 3$. Hence, sketch the graph of function y

10. a. The quadratic equation $2x^2 + px = 3x - 2$, where p is a constant, has roots h and k. Find the range values of p
    b. Find the range of values of x that satisfy the inequality $(2x - 5)(2x - 3) \geq 4x - 6$

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11. Find the range of p if $2x^2 + 2px + 1 = 2x + p$ does not have any real roots

12. The quadratic function $f(x) = 4(x - p)^2 + q$, where p and q are constants , has a minimum point at $H(2a - 1, 3a + 2)$

    a. Express p and q in terms of a

    b. Find the range of values of r such that $f(x) = r$ has two real roots when a=1

       Type equation here.

13. The diagram below shows the graph of quadratic equation $f(x) = px^2 - 2px + q$
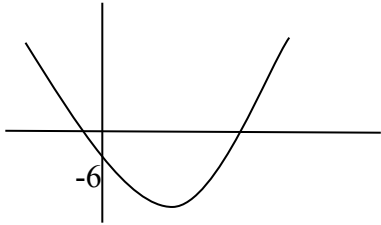
    a. state the value of q

    b. determine the range of values of p

14. The diagram below shoes the graph of the quadratic functions $f(x) = 2x^2 + 2x - 4$ and $g(x) = (x + p)^2 - \frac{9}{4}$.Find
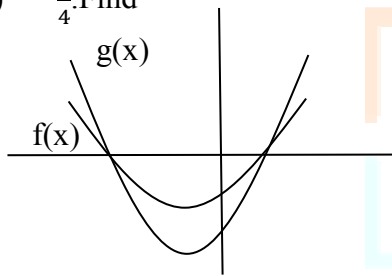
    a. the value of p

    b. the minimum points of both function $f(x)$ and $g(x)$

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