Cambridge International AS & A Level

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Mathematics 9709/32

Paper 3 Pure Mathematics 3 October/November 2025

Question No(1)

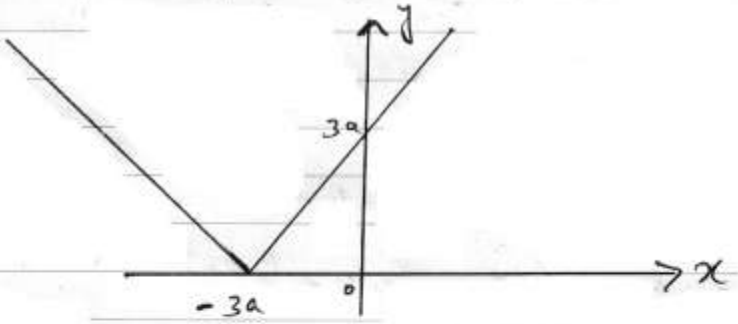
1 **(a)** Sketch the graph of $y = |x+3a|$, where a is a positive constant.

(b) Hence or otherwise solve the inequality $|x+3a| > a-2x$.

Solution:

(a) $y = |x + 3a|$

x	0	$-3a$
y	$3a$	0



(b) $|x + 3a| > a - 2x$

squaring

$(x + 3a)^2 > (a - 2x)^2$

$x^2 + 6ax + 9a^2 > a^2 - 4ax + 4x^2$

$x^2 + 6ax + 9a^2 - a^2 + 4ax - 4x^2 > 0$

$-3x^2 + 10ax + 8a^2 > 0$

$3x^2 - 10ax - 8a^2 < 0$

$3x^2 - 12ax + 2ax - 8a^2 < 0$ factorizing

$3x(x - 4a) + 2a(x - 4a) < 0$

$(x - 4)(3x + 2a) < 0$

$\therefore a$ is +ve

$3x + 2a > 0$

$x > -\frac{2a}{3}$