

Algebra - A

- (1) Use the definition of absolute value to rewrite the following expressions without using the absolute value symbol.

(a) $|x-2|$

(b) $x-|x|$

- (2) Solve the inequalities:

(a) $|x-3| \leq 1$

(b) $x^2 < 2x+8$

(c) $\frac{x+1}{x-5} > 0$

- (3) Factor:

(a) $x^3(a+2b) - 27(a+2b)$

(b) $3x^{1/2} - 9x$

(c) $6x^2(2x+1)^{-1/3} + 2x(2x+1)^{2/3}$

(d) x^3+4x^2+x+4

- (4) Simplify

(a) $\frac{\frac{-1}{\sqrt{1-x^2}} + \sqrt{1-x^2}}{x^2}$

(b) $\frac{3(1+x)^{1/3} - x(1+x)^{-2/3}}{(1+x)^{2/3}}$

(c) $\frac{(x+h)^{-3} - x^{-3}}{h}$

Analytic Geometry - B

- (5) (a) Find the equation of the line which passes through the points (2,1) and (-5,2).
(b) Roughly estimate the slopes of each of the lines:



Functions - C

(6) (a) Given $g(x) = \frac{1}{x}$ find and simplify: $\frac{g(x)-g(a)}{x-a}$

(b) Given $f(x) = x^2-3x$ find and simplify: $\frac{f(x+h)-f(x)}{h}$

- (7) Sketch the graph of f . You should not "just plot points".

(a) $f(x) = \sqrt{x+2} - 1$

(b) $f(x) = |x| + x$

(c) $f(x) =$

$$\begin{cases} x^2 & \text{if } x \leq 0 \\ \sqrt{4-x^2} & \text{if } 0 < x \leq 2 \\ 2x-3 & \text{if } x > 2 \end{cases}$$

Trigonometry - D

- (8) Find the following trigonometric values exactly (no calculator)

(a) $\sin(7\pi/6)$

(b) $\tan^{-1}(-1)$

(c) $\cos(\pi)$

(d) $\sin(-\pi/3)$

(e) $\cot(7\pi/4)$

(f) $\tan(3\pi/2)$

(g) $\cos^{-1}(-1/2)$

(h) $\sin^{-1}\left(-\frac{\sqrt{2}}{2}\right)$

- (9) Graph $f(x) = -2 \cos(2x)$

(10) Find all solutions in $[0, 2\pi)$: $2\cos^2x = 1 + \sin x$

- (11) Solve: $\sin 2x - \cos x = 0$.