



DULWICH COLLEGE SHANGHAI

IBDP Standard Level Mathematics – Presumed Knowledge.

Non-calculator. Total Marks = 50

Name.....Form.....

- 1) Simplify the following surds and expressions.

a) $\sqrt{32}$	b) $\sqrt{32} + \sqrt{18}$
[2]	[2]

- 2) Rationalise the denominators of these fractions and simplify.

a) $\frac{16}{\sqrt{2}}$	b) $\frac{2 + \sqrt{3}}{2 - \sqrt{3}}$
[2]	[3]

- 3) Simplify each expression

a) $(2x^2)^3$	
	[2]
b) $\frac{5x^2 - 4x^7}{x^5}$	
	[2]



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4) Expand and simplify:

a)  $(2x - 1)(3x + 2) - 2x(x - 2)$

[2]

5) Factorise

a) $16x^2 + 24xy$	b) $x^2 + 3x - 10$
	[2]
c) $25a^2 - 81b^2$	e) $4x^2 + 4x - 15$
	[2]

6) Express as a single fraction

a) $\frac{5x - 20}{3x} \times \frac{1}{2x - 8}$	b) $\frac{6}{x + 4} + \frac{3}{x - 3}$
	[2]



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7) Solve the equations

a) $x + 3(x + 1) = 2x$	b) $\frac{3x - 4}{3} - \frac{x - 1}{2} = \frac{1}{6}$	[2]	[3]
c) $x^2 + (x + 1)^2 = (2x - 1)(x + 4)$	d) $\frac{14}{x - 3} = \frac{10}{x + 5}$	[3]	[3]

8) Make  $x$  the subject in the following:

a) $\frac{x}{n} - n = -p$	[2]
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b)  $\sqrt{\frac{x+1}{x}} = a$

[3]

9) Solve the following simultaneous equations:

$$3x - 2y = 19$$

$$-3x + 5y = 5$$

[3]

10) Solve the equation  $4x^2 - 3x - 2 = 0$ , leaving your answer as a surd, using

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

[3]