projectmaths

Basic Arithmetic and Algebra

16	**11 c**	Solve $\|x - 2\| \leq 3$.	**2**	Solution
16	**11 e**	Find the points of intersection of $y = -5 - 4x$ and $y = 3 - 2x - x^2$.	**3**	Solution
15	**1**	What is 0.00523359 written in scientific notation, correct to 4 significant figures? (A) 5.2336×10^{-2} (B) 5.234×10^{-2} (C) 5.2336×10^{-3} (D) 5.234×10^{-3}	**1**	Solution
15	**11 a**	Simplify $4x - (8 - 6x)$	**1**	Solution
15	**11 b**	Factorise fully $3x^2 - 27$	**2**	Solution
15	**11 c**	Express $\frac{8}{2+\sqrt{7}}$ with a rational denominator.	**2**	Solution
14	**1**	What is the value of $\frac{\pi^2}{6}$, correct to 3 significant figures? (A) 1.64 (B) 1.65 (C) 1.644 (D) 1.645	**1**	Solution
14	**6**	Which expression is a factorisation of $8x^3 + 27$? (A) $(2x - 3)(4x^2 + 12x - 9)$ (B) $(2x + 3)(4x^2 - 12x + 9)$ (C) $(2x - 3)(4x^2 + 6x - 9)$ (D) $(2x + 3)(4x^2 - 6x + 9)$	**1**	Solution
14	**11 a**	Rationalise the denominator of $\frac{1}{\sqrt{5}-2}$.	**2**	Solution
14	**11 b**	Factorise $3x^2 + x - 2$.	**2**	Solution
13	**1**	What are the solutions of $2x^2 - 5x - 1 = 0$? (A) $x = \frac{-5 \pm \sqrt{17}}{4}$ (B) $x = \frac{5 \pm \sqrt{17}}{4}$ (C) $x = \frac{-5 \pm \sqrt{33}}{4}$ (D) $x = \frac{5 \pm \sqrt{33}}{4}$	**1**	Solution
12	**1**	What is 4.097 84 correct to three significant figures? (A) 4.09 (B) 4.10 (C) 4.097 (D) 4.098	**1**	Solution
12	**2**	Which of the following is equal to $\frac{1}{2\sqrt{5}-\sqrt{3}}$? (A) $\frac{2\sqrt{5}-\sqrt{3}}{7}$ (B) $\frac{2\sqrt{5}+\sqrt{3}}{7}$ (C) $\frac{2\sqrt{5}-\sqrt{3}}{17}$ (D) $\frac{2\sqrt{5}+\sqrt{3}}{17}$	**1**	Solution
12	**11 a**	Factorise $2x^2 - 7x + 3$.	**2**	Solution
12	**11 b**	Solve $\|3x - 1\| < 2$.	**2**	Solution
11	**1a**	Evaluate $\sqrt[3]{\frac{651}{4\pi}}$ correct to four significant figures.	**2**	Solution
11	**1b**	Simplify $\frac{n^2 - 25}{n - 5}$.	**1**	Solution

11	**1c**	Solve $2^{2x+1} = 32$.	**2**	Solution
11	**1e**	Solve $2 - 3x \leq 8$.	**2**	Solution
11	**1f**	Rationalise the denominator of $\frac{4}{\sqrt{5}-\sqrt{3}}$. Give your answer in the simplest form.	**2**	Solution
11	**9d**	(i) Rationalise the denominator in the expression $\frac{1}{\sqrt{n}+\sqrt{n+1}}$, where n is an integer and $n \geq 1$.	**1**	Solution
		(ii) Using your result from part (i), or otherwise, find the value of the sum $\frac{1}{\sqrt{1}+\sqrt{2}} + \frac{1}{\sqrt{2}+\sqrt{3}} + \frac{1}{\sqrt{3}+\sqrt{4}} + \ldots + \frac{1}{\sqrt{99}+\sqrt{100}}$.	**2**	
10	**1a**	Solve $x^2 = 4x$.	**2**	Solution
10	**1b**	Find integers a and b such that $\frac{1}{\sqrt{5}-2} = a + b\sqrt{5}$.	**2**	Solution
10	**1d**	Solve $\|2x + 3\| = 9$.	**2**	Solution
09	**1b**	Solve $\frac{5x-4}{x} = 2$.	**2**	Solution
09	**1c**	Solve $\|x + 1\| = 5$.	**2**	Solution
08	**1b**	Factorise $3x^2 + x - 2$.	**2**	Solution
08	**1c**	Simplify $\frac{2}{n} - \frac{1}{n+1}$.	**2**	Solution
08	**1d**	Solve $\|4x - 3\| = 7$.	**2**	Solution
08	**1e**	Expand and simplify $(\sqrt{3} - 1)(2\sqrt{3} + 5)$.	**2**	Solution
07	**1a**	Evaluate $\sqrt{\pi^2 + 5}$ correct to two decimal places.	**2**	Solution
07	**1b**	Solve $2x - 5 > -3$ and graph the solution on a number line.	**2**	Solution
07	**1c**	Rationalise the denominator of $\frac{1}{\sqrt{3}-1}$.	**2**	Solution
07	**1e**	Factorise $2x^2 + 5x - 12$.	**2**	Solution
06	**1b**	Factorise $2x^2 + 5x - 3$.	**2**	Solution
06	**1e**	Solve $3 - 5x \leq 2$.	**2**	Solution

05	**1a**	Evaluate $\sqrt{\frac{275.4}{5.2 \times 3.9}}$ correct to two significant figures.	**2**	Solution
05	**1b**	Factorise $x^3 - 27$.	**2**	Solution
05	**1d**	Express $\frac{(2x-3)}{2} - \frac{(x-1)}{5}$ as a single fraction in its simplest form.	**2**	Solution
05	**1e**	Find the values of x for which $\lvert x - 3 \rvert \leq 1$.	**2**	Solution