

1. Number

1.1	Knowledge and use of numbers and the number system including fractions, decimals, percentages, ratio, proportion and order of operations are expected
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General numeracy skills. **ACCURACY!**

1.2	The product rule for counting	Work out how many 5-digit odd numbers can be formed using the digits 1 3 4 6 8 with no repetition of any digit
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Limitation is on last digit, so start there.

2 ways to choose the last digit {1, 3}  
Then 4 ways to choose the second last.  
" 3 ways " " third digit.  
" 2 ways " " second digit.  
Then only one way to choose the last.

$2 \times 4 \times 3 \times 2 (\times 1) = \underline{\underline{48 \text{ ways}}}$

1.3	Manipulation of surds, including rationalising the denominator	<p>The use of surds in exact calculations</p> <p>Write <math>\sqrt{200} - \sqrt{72} + 3\sqrt{162}</math> in the form of <math>a\sqrt{2}</math></p> <p>Rationalise and simplify <math>\frac{3\sqrt{2} + 4}{5\sqrt{2} - 7}</math></p> <p>Write the expression <math>\frac{3\sqrt{3} + 7}{3\sqrt{3} - 5}</math> in the form <math>a + b\sqrt{3}</math>, where <math>a</math> and <math>b</math> are integers</p>
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To rationalise

$\frac{\dots}{a + \sqrt{b}} \times \frac{a - \sqrt{b}}{a - \sqrt{b}}$

etc...

e.g.  $\frac{3\sqrt{2} + 4}{5\sqrt{2} - 7} \times \frac{5\sqrt{2} + 7}{5\sqrt{2} + 7} = \frac{41\sqrt{2} + 58}{1}$

$(3\sqrt{2} + 4)(5\sqrt{2} + 7)$   
 $= 15 \times 2 + 21\sqrt{2} + 20\sqrt{2} + 28$   
 $= 41\sqrt{2} + 58$

$(5\sqrt{2} - 7)(5\sqrt{2} + 7)$   
 $= 25 \times 2 + 35\sqrt{2} - 35\sqrt{2} - 49$   
 $= 1$

$= \underline{\underline{41\sqrt{2} + 58}}$