

Level 3 Test – Skills

Name

Number Facts Section 2 minutes Non-calculator

10 points minus 1 point per incorrect or missing answer. Minimum 0.

Score: /10

	Question	Answer	Tick
Q1	$4 + 7$		
Q2	$6 + 5$		
Q3	5×7		
Q4	$12 - 8$		
Q5	$6 + 9$		
Q6	$27 \div 3$		
Q7	4×7		
Q8	$12 - 9$		
Q9	$6 + 7$		
Q10	7×6		
Q11	3×8		
Q12	$32 \div 4$		
Q13	$4 + 7$		
Q14	$54 \div 9$		
Q15	$16 - 9$		

	Question	Answer	Tick
Q16	5×8		
Q17	$11 - 5$		
Q18	$8 + 5$		
Q19	$30 \div 6$		
Q20	$36 \div 9$		
Q21	3×4		
Q22	$7 + 5$		
Q23	$13 - 6$		
Q24	6×8		
Q25	$24 \div 8$		
Q26	9×5		
Q27	$56 \div 8$		
Q28	$9 + 8$		
Q29	$12 - 6$		
Q30	8×6		

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Mental Arithmetic Section 10 minutes Non-calculator

Each question is worth 1 mark. Only answers required. Scribbling paper allowed.

Score: /15

	Question	Answer	Tick
Q1	$419 + 674$		
Q2	$380 - 184$		
Q3	2500×40		
Q4	$489 \div 3000$		
Q5	115.5×2		
Q6	$1\frac{3}{5} \times 105$		
Q7	$19 \div \frac{1}{4}$		
Q8	0.4×0.005		
Q9	$0.06 \div -200$		
Q10	$-12.8 + -4.1$		
Q11	20×-4.2		
Q12	$3\frac{1}{5} \times \frac{3}{4}$		
Q13	$25 \div \frac{5}{8}$		
Q14	$9 + -12 \div (0 + 3 \times 2)$		
Q15	$11 - 2 + 5 \div (2 + 2)$		

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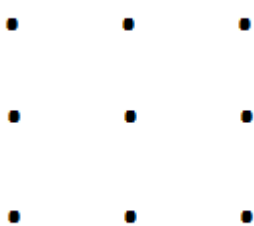
Name

Problem Solving Section 45 minutes Calculators allowed

Work on the paper provided. Show your working and explain your thinking. You will get credit for solving the problems and for your communication. Part solutions will get part of the marks.

Problem Solving Score: /25

Communication Score: /10

Q1	<p>55 is the 10th triangular number since $1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 = 55$</p> <p>55 is also the 5th pyramidal number since $1^2 + 2^2 + 3^2 + 4^2 + 5^2 = 55$.</p> <p>There is another two-digit number that is both a triangular number and a pyramidal number. What is the number?</p>	/5
Q2	<p>A Toyota travels 120 kilometres in the time that a Ferrari moving 40 km/h faster travels 150 kilometres. How fast does the Toyota travel?</p>	/10
Q3	<p>A set of three points is randomly selected from the grid below. What is the probability that the three points lie in a straight line?</p>  <p>The grid consists of 9 points arranged in a 3x3 square pattern.</p>	/10

Q3 is from The SE Queensland Maths Team Challenge, 2012.

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Investigating Section

1 week

Calculators allowed

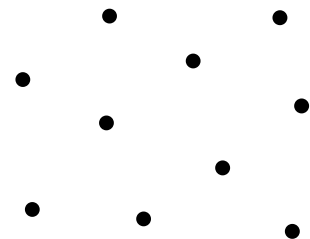
Work on the paper provided. Show your working and explain your thinking. You will get credit for what you find and for your communication.

Investigating Score: /25

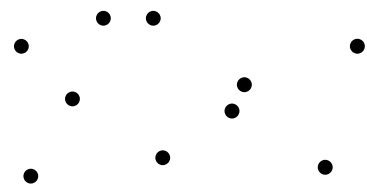
Communication Score: /15

A group of towns can be clustered to different degrees.

These towns are fairly evenly spaced and thus have a very low degree of clustering.



These towns are more randomly spaced and so have a higher degree of clustering.



These towns have a very high degree of clustering.



Develop a clustering index that can be mathematically derived from measurements of distances between the towns. The index should be 0 for evenly spaced (un-clustered) towns, 1 for the hypothetical situation where all the towns are in the same place (obviously impossible) and somewhere in between for more randomly (and realistically) distributed towns.