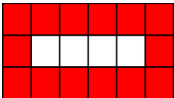Maths Competency Test – Solutions

**Question1** - Relates to the decomposition of numbers, examines equivalent expressions and investigates student understanding of equality.

*Answer:* (i) 16, (ii) & (iii) An infinite number of correct answers are possible

**Question 2** - Expressing co-variation between 2 variables given the geometrical representation and examining equality of expressions in different forms. This also allows for identification of multiplicative thinking and various methods towards generalising from the growing pattern.

*Answer:*

(i)               (ii) 7      (iii) No

(iv) $s = 6 + 2w;\ s = 8 + 2(w - 1);\ s = 3(w + 2) - w;\ s = 2(w + 2) + 2$

Where $s$= number of shaded tiles and $w$=number of white tiles.

*Accept any form of the correct statement written in words

**Question 3** – Conceptual understanding of the variable

*Answer*: $(d)$

**Question 4** – Analysing student understanding of the order of operations

*Answer*: $(c)$

**Question 5** –Conceptual understanding of the variable

Answer:$(c)$

**Question 6** – Conceptual understanding of the variable

Answer: $(d)$

**Question 7** –Identifying misconceptions when applying the Distributive Law

Answer: $(b)$

**Question 8** – Application of inverse operations

Answer: $(a)$

**Question 9** – Conceptual understanding of the distributive law

Answer: $(d)$

**Question 10** –Use of factorisation to simplify expressions

Answer: $(a)$

**Question 11** –Generalising from numbers and leading to the notion of proof through the use of the variable

Answer: $(b)$

**Question 12** – Conceptual understanding of the addition of algebraic fractions

Answer: $(c)$

**Question 13** – Understanding when/where the commutative law applies and the investigation of factorisation

Answer: $(c)$

**Question 14** – Understanding  variables, independent and dependent variables, rate of change

Answer: $(b)$

**Question 15** – Investigation of student understanding of the laws of indices

Answer: $(d)$

**Question 16** –  Investigation of student understanding of the laws of indices

Answer: $(a)$

**Question 17** – Reasoning with variables and generalising operations

Answer: $(d)$

**Question 18** – Problem solving. Reinforce the importance of checking answers as problems can evoke an answer that is intuitive and incorrect

Answer: $(c)$

**Question 19** – Reasoning with operations

Answer: $(a)$

**Question 20** – Proportional reasoning

Answer: $(b)$