

# Practice Mathematics Content Knowledge Exam

## Lakehead University

- **The exam is two hours long.**
- No calculators are allowed.
- The following manipulatives are available: a ruler, cubes, fraction pieces, graph paper, scissors, tape, and a rectangular prism
- It is to your advantage to show your work, however, it is not required.
- 15 questions, 3 marks per question, pass set at 75%

### Number Sense and Numeration

1. Last year there were 800 students in the preservice program. This year there are 1000. What percentage increase of students is that?
2. Jesse was planning the amount of time he would devote to each strand in his 120 hour math course. He planned to spend 0.4 of the time on measurement and data management, 15% of the time on algebra,  $\frac{3}{8}$  of the time on numeracy, and the remainder of the time on geometry. How many hours were spent on each of the four strands?
3. Jerusha has two bowls of fruit on her kitchen table. In one bowl she has a ratio of 1 apple to every 2 bananas. In the second bowl she has a ratio of 2 plums to every 3 oranges. Both bowls have the same total number of fruit. How many are there of each fruit? (Give one possible assortment.)
4. A group of 150 tourists were visiting Thunder Bay. Two tenths of this group went to the Terry Fox lookout. Two thirds of the 150 went to Historical Fort William. All the rest went out to the Sleeping Giant. How many tourists went to the Sleeping Giant?
5. Luis exercises by running 5km. each day. The course he runs is  $\frac{1}{4}$  km. long. How many times does he run the course each day?
6. Of the following fractions:  $\frac{3}{4}$ ,  $\frac{5}{12}$ ,  $\frac{2}{3}$ ,  $\frac{3}{2}$ ,  $\frac{2}{5}$ , and  $\frac{5}{8}$ , which two fractions (and only two) will give a sum that is less than 1?

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### Measurement

7. How many 750 mL bottles can be filled from 600L of water?
8. A farm water tower (with a capacity of 615 cubic metres) has sprung a leak. It loses water at the rate of 1 cubic metre an hour. If no one fixes it, when would the tower be empty? (Answer in weeks, days and hours; for example, 2 weeks, 2 days and 5 hours.)

9. You purchased \$14.70 worth of CD cases. Each case costs 35 cents and is 5.2 mm thick. How many cm tall is your stack of CD cases?
10. A rectangular box with no lid has a base of 4 cm by 7 cm and a height of 2cm. What is the exterior surface area of the box?
11. Workers are laying large rectangular tiles measuring 4 x 6 metres. If they want to fit them into a square, what is the minimum number of these tiles they would need?
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### **Patterning and Algebra**

12. Dave gave Charlotte half of his hockey cards. Charlotte gave Johnnie half of the cards she received from Dave. Johnnie kept 8 of those cards and gave the remaining 10 to Dana. How many hockey cards did Dave have to start?
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### **Data Management and Probability**

13. Vanessa set a school record for most points in a single basketball game when her team scored 48 points in total. The five other players on her team who scored, averaged 5 points each. How many points did Vanessa score to set her school record?
14. Each of the six faces of a cube is painted either red or blue. When the cube is tossed, the theoretical probability of the cube landing with the red face up is  $\frac{2}{3}$ . How many faces are red?

### **Profit**

15. A retailer buys 40-metre bolts of cloth for \$184.00 What price should he charge per meter to make a profit of 25%?

## Answers to Math Content Practice Quiz

1. 25% increase in students
2. 48 hours, 18 hours, 45 hours and 9 hours on geometry
3. 5 apples : 10 bananas and 6 plums : 9 oranges
4. 20 people
5. 20 laps
6.  $\frac{2}{5}$  and  $\frac{5}{12}$
7. 800 bottles
8. 3 weeks, 4 days, 15 hours
9. 21.84 cm or 218.4 mm
10. SA = 72 sq. cm.
11. 6 tiles
12. 72 cards
13. 23 points
14. 4 faces
15. \$5.75