Primary – Junior Mathematics Diagnostic
August 2009

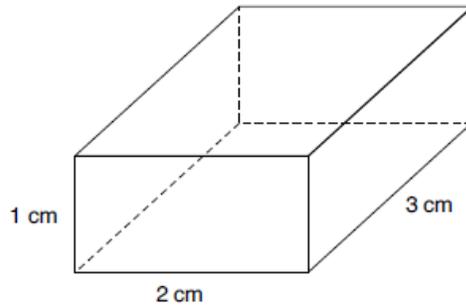**Student Number:** _____   **Section Number:** _____

Are you enrolled in the Math for Teachers Elective Course?   ☐ *Fall*   ☐ *Winter*   ☐ *No*

NOTE: *Each "Show your work / Explain your thinking" question has a value of 3 points. Each multiple choice / fill in the blank question has a value of 1 point.*

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1. Write the number 90 090 in words: _____

2. What is the total surface area of the rectangular prism below?

Show your work.

3. A package of 3 pairs of socks costs $3.90. What is the cost of one pair of socks?

   a) $1.30
   b) $1.90
   c) $6.90
   d) $11.70

4. Consider the three equations below.

$m + 9 = 12$

$m + n + 3 = 14$

$m + n + p = 15$

What is the value of p? Show your work.

5. What is the missing term in the following pattern: 532, 515, ___, 481, 464

Show your work.

6. Maddie's and Lisa's scores on 5 math quizzes are shown in the table below.

Math Scores out of 30

Maddie's scores	20	23	28	21	23
Lisa's scores	21	22	26	25	26

According to the data in the table, Maddie's mean score is …

a) lower than Lisa's mean score.
b) the same as Lisa's mean score.
c) higher than Lisa's median score
d) the same as Lisa's median score

7. Daneen connects 5 cubes as shown below. The dimensions of each cube are 2cm X 2cm X 2cm.
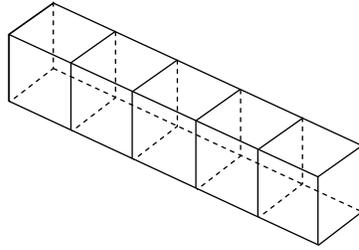
Daneen wants to paint the outside of connected cubes with red paint. The cost to paint 1 cm^2 is $0.75. How much will it cost to paint the outside of the 5 connected cubes?

Show your work.

8. Which of the following diagrams represents the quantity ¼? **Circle all correct representations.**

A   B   C   D
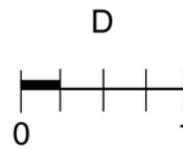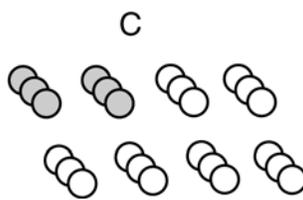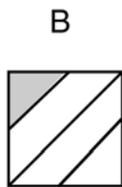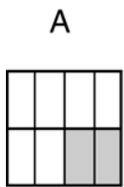
9. Joseph finishes a swim race in 73.365 seconds. Joseph knows the following about his friend's time for the same race.

- The digit in the hundredths column is 3 more than Joseph's.
- The digit in the ones column is 2 less than Joseph's.

In what time does Joseph's friend swim the race?

Justify your thinking.

10. Which of the following represents the probability of an event that is very likely to occur?

   a) 0
   b) 0.15
   c) 0.85
   d) 1

Explain your thinking.

11. Which of the following has the greatest quantity?

   a) 1.240
   b) 1.30
   c) 1.08
   d) 1.1

Explain your thinking.

12. A pattern that increases when the same amount is added to each term is represented in the table below.

Term Number	Term Value
1	11
2	17
3	23
4	29
5	35

If this pattern continues, what is the term number when the term value is 53?

Show your work.

13. A group of 6 people equally shares 12 litres of juice. How many millilitres of juice does each person receive?
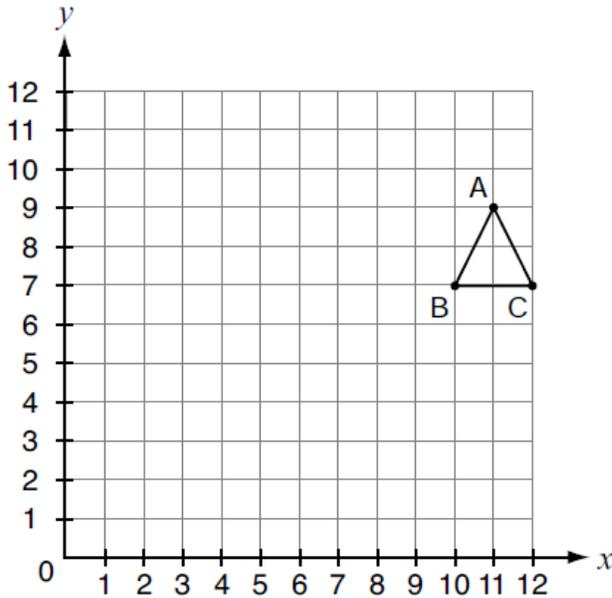
a) 2
b) 72
c) 2000
d) 12 000

Show your work.

14. At rest, you blink about 20 times per minute. At this rate, how long will it take you to blink about 1 000 000 times?

    a) 500 000 minutes
    b) 20 000 000 minutes
    c) 50 000 minutes
    d) 5000 minutes

Show your thinking.

15. Triangle ABC is graphed on the grid below.

    Triangle ABC is moved 3 units to the left and 4 units down. What are the new coordinates of Point C?

    a) (3,9)
    b) (7,3)
    c) (8,5)
    d) (9,3)

16. All 130 students sign up for one of five activities. The table below shows some of the results.

**Activity Sign-Up**

Activity	Number of Students
Soccer	38
Chess	13
Band	33
Drama	
Photography	14

Susan estimates that 25% of the students signed up for drama. Jessica estimates that 50% of the students signed up for drama.
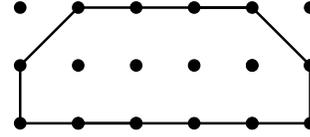
Using the benchmarks of 10%, 25%, 50%, 75% or 100%, justify which estimate is more appropriate.

17. Mr. Clarke is using Geoboards (dot paper) with his class to explore perimeter. The pegs on the Geoboard (or dots on the paper) are one unit apart. For each of the shapes below, determine whether the perimeter EQUALS 12 units. **Circle all shapes that have a perimeter of 12 units.**
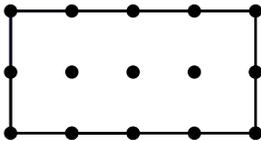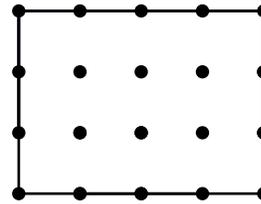
a)
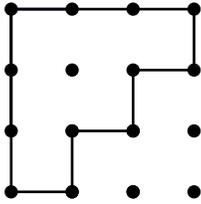
c)

b)

d)

18. A teacher plants 6 tulips and 9 roses in a planter. Which of the following represents the ratio of roses to tulips?

a) $\frac{3}{2}$ 　　　　 b) $\frac{2}{3}$ 　　　 c) $\frac{15}{9}$ 　　　 d) $\frac{9}{15}$

Justify your answer.

19. As students we were often taught "rules of thumb" to help us remember particular mathematical ideas or procedures. Sometimes, however, these memory devices are not actually true, or they are not true for _all_ numbers. For each of the following, determine whether it is true all of the time or not.

	True for all numbers	Not always true
a) If the first of two numbers is smaller than a second, and you add the same number to both, then the first sum is smaller than the second.		
b) Multiplying a number makes it larger.		
c) To multiply any number by 10, add a zero to the right of the number.		
d) You cannot subtract a smaller number from a larger number.		

20. Look at the figures below.
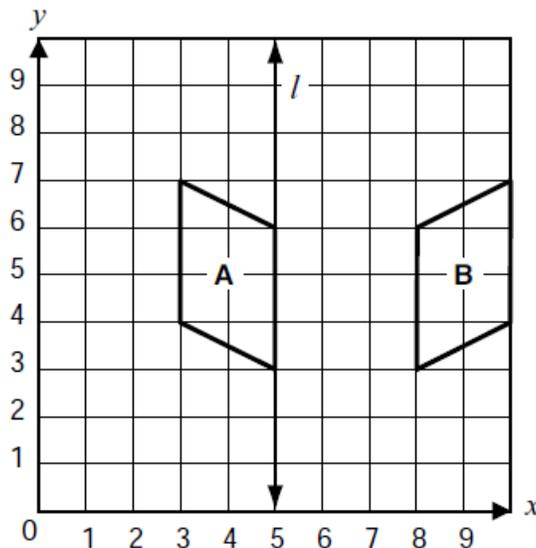
Which of the following describes how Parallelogram A was moved to create Parallelogram B?

a) reflection over line _l_
b) a translation/slide 3 units to the right
_c)_ a translation /slide 3 units to the left, then a reflection over line _l_
d) a translation /slide 3 units to the right, then a reflection over line _l_

21. Jenn's dad thinks the answer to this skill testing question is 57. Jenn thinks the answer is 33.
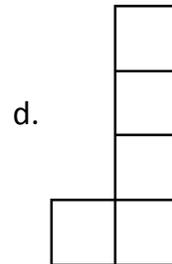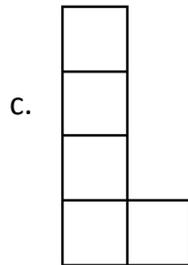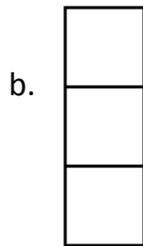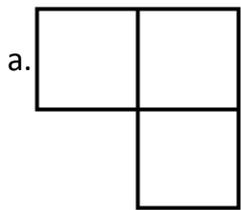
$4 + 5 \times 7 - 6 =$ ___

Who is correct? Explain your thinking.

22. The three-dimensional figure below has been built using cubes
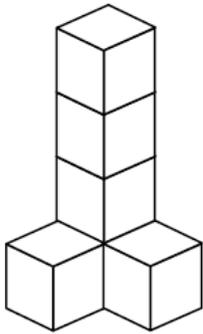
What is a top view of this figure?

a.   b.   c.   d.

23.
    a. Write a number that is halfway between 1.1 and 1.11

    b. Write a number between 0.65 and 0.7

24. The faces of a die are labelled 1, 2, 2, 3, 4 and 5. The die is rolled 200 times.

How many times would you expect the number 2 to appear?

Justify your answer.

25. Ms. Sanchez asked her students to write a formula for the perimeter of the rectangle pictured below. She was surprised by all the different answers students came up with. Which answer should she not accept as correct? (Mark ONE answer).

a) $P = 2w + 2l$

b) $P = 2lw$

c) $P = 2(l + w)$

d) $P = l + w + l + w$

w [rectangle with l labelled below]