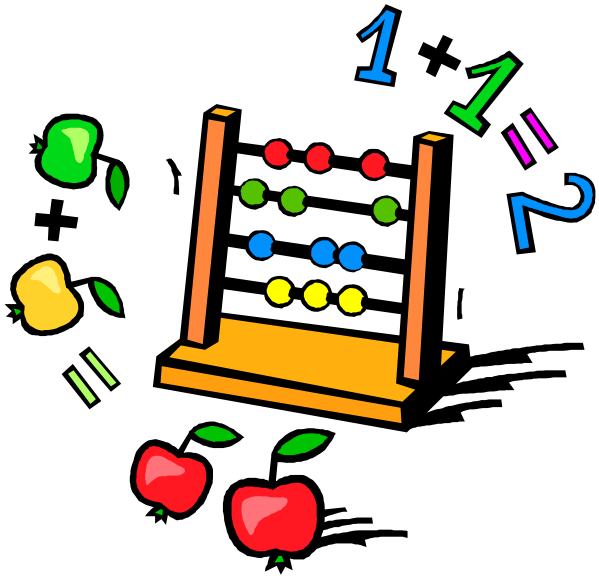
End of Grade 9 I.R.P.

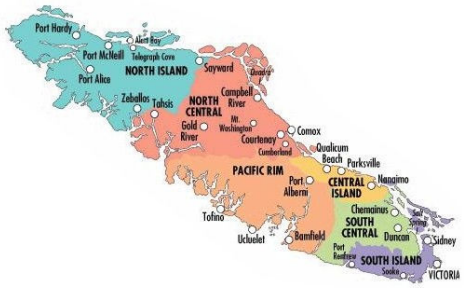
Beginning of Grade 10

Diagnostic Math Assessment

Last updated: May 7, 2009



WNCP
Edition



Vancouver IslandNet

1. What is the side length of a square garden whose area is $36m^2$?

A -6 *m*
B +6 *m*
C $\pm$6 *m*
D +18 *m*

2. Which power has the greatest value?

A 2^5
B 3^4
C 4^3
D 5^2

3. Which order of operations will give you the correct answer to the following question?

$$\frac{26.9}{14.3(14.5-7.9)}$$

A Subtract, Multiply, Divide
B Multiply, Subtract, Divide
C Divide, Subtract, Multiply
D Divide, Multiply, Subtract

4. What is the value of -2^4?

A -16
B -8
C 8
D 16

5. Simplify:

$$\frac{5^3}{5^2} \times \frac{4^5 \times 4^2}{(4^2)^4}$$

A $\frac{5^1}{4^1}$

B $\frac{5^1}{4^5}$

C $\frac{13^{10}}{9^7}$

D $\frac{80^{30}}{20^{16}}$

6. Which set has the rational numbers in order from least to greatest?

A $-6,\ -0.\overline{6},\ -0.66,\ 0.6,\ \frac{2}{3},\ 0.66$

B $-6,\ -0.66,\ -0.\overline{6},\ 0.6,\ 0.66,\ \frac{2}{3}$

C $-6,\ -0.66,\ -0.\overline{6},\ 0.6,\ \frac{2}{3},\ 0.66$

D $-6,\ -0.\overline{6},\ -0.66,\ 0.6,\ 0.66,\ \frac{2}{3}$

7. Which is the correct <u>first</u> step to simplify the expression: $(16 + 4 \div 2 - 8)^2$?

A $(20 \div 2 - 8)^2$

B $(20 \div -6)^2$

C $(16 + 2 - 8)^2$

D $(16 + 2 - 8^2)$

8. Find the square root of: $\frac{4}{625}$

A $\frac{2}{625}$

B 0.08

C $\frac{4}{25}$

D 0.8

9. $\sqrt{11}$ lies between which 2 whole numbers?

A 3 and 4

B 4 and 5

C 9 and 19

D 10 and 12

10. The cost of renting a car for one day is represented by the equation:

$C = 59.95 + 0.145d$

Where:

- C is the cost in dollars
- d is the distance traveled in kilometers.

Determine the total rental cost for a trip of 125 km.

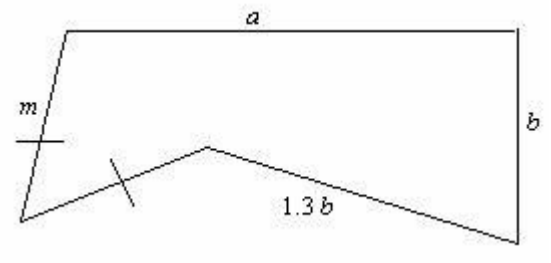
A $18.13

B $59.15

C $78.08

D $241.20

11. Which expression represents the perimeter of the figure?



A a + 2.3b + m

B a + 2.3b + 2m

C 2.3b + 2m

D 1.3abm

12. Which of the following inequalities is NOT equivalent to:

$4x + 8 \leq 28$

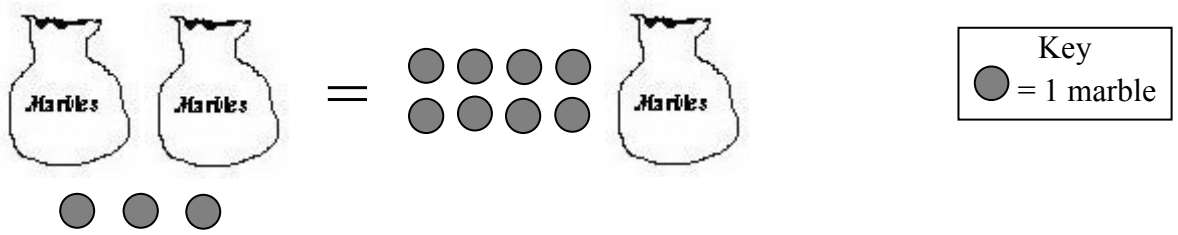
A $x \leq 5$

B $2x + 4 \leq 14$

C $4x \leq 36$

D $12x \leq 60$

13. If each bag contains the same number of marbles, which equation best represents the diagram?



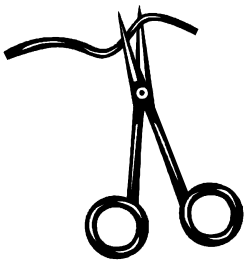
A 2x + 3 = 8 + x

B 2 + 3x = 8x + 1

C 23x = 18x

D 5x = 9x

14. A 70cm string is cut into 3 pieces
- One piece is twice as long as the shortest piece
- Another piece is 10cm longer than the shortest piece.



Find the length of the **longest** piece.

A 15 cm

B 25 cm

C 30 cm

D 35 cm

15. What is the coefficient of : $5a^2b$

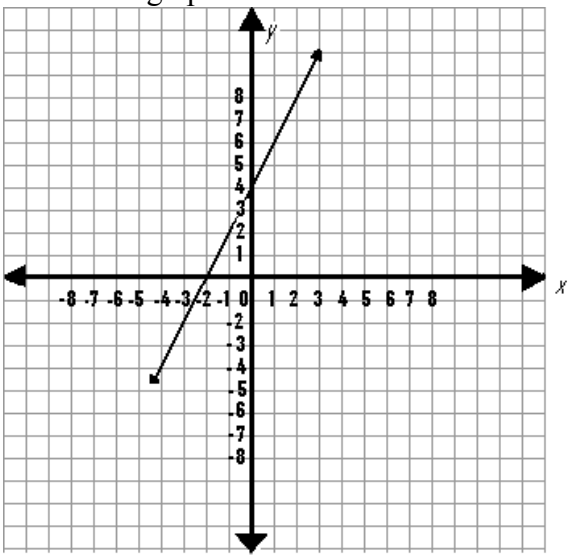
A 4

B 5

C a

D b

16. Which expression represents the graph?



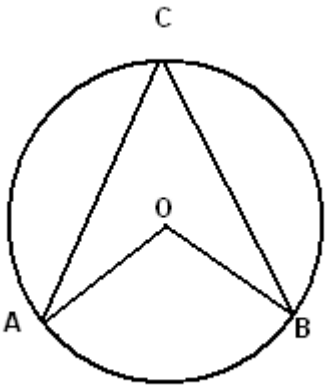
A $y = x + 4$

B $y = 2x - 4$

C $y = 2x + 4$

D $y = 4x + 2$

17. In this diagram: ∠ACB is the



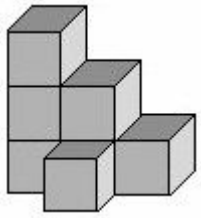
A arc

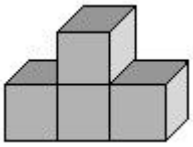
B central angle

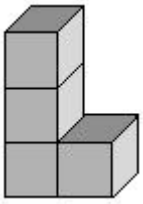
C chord

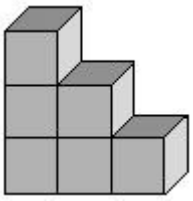
D inscribed angle

18. Which 3D figure has the greatest surface area?

A 

C. 

B 

D. 

19. A person 185cm tall casts a shadow 47cm long. A nearby pole casts a shadow 310cm long. What is the height of the pole?

A 28.0 cm

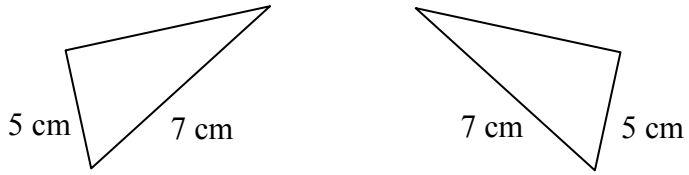
B 78.8 cm

C 1220.2 cm

D 14 570.0 cm

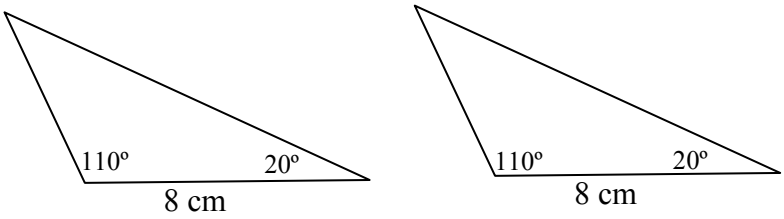
20. Which pair of triangles **CANNOT** be proven to be similar?

A

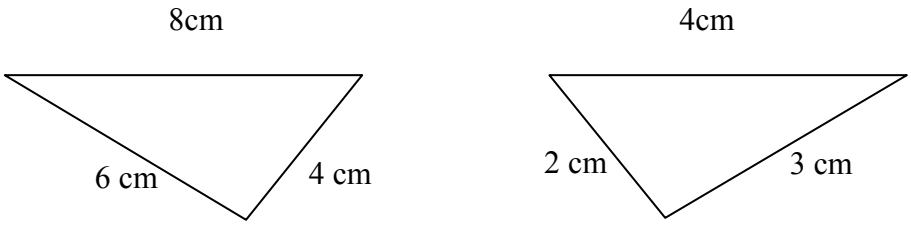


B

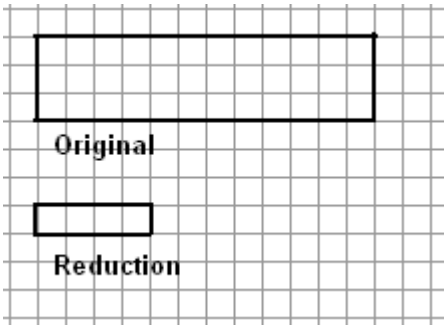
C



D



21. Determine the scale factor of the reduction.



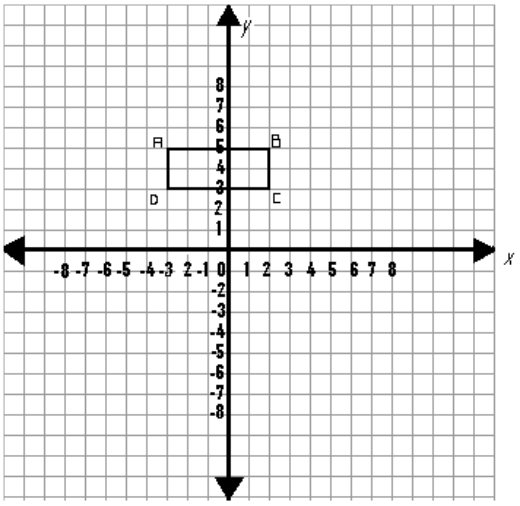
A $\frac{1}{4}$

B $\frac{1}{3}$

C $\frac{3}{1}$

D $\frac{4}{1}$

22.



After translating the figure ABCD 6 units down and 3 units right, vertex A is at:

A (0, 0)

B (0, -1)

C (-1, 0)

D (-3, -1)

23. Collected data must be used only for purposes told to those surveyed.
This is an example of:

A bias

B cultural diversity

C ethics

D privacy

24. The school is considering banning cell phones. Identify the populations that should be surveyed to represent the opinion of the student body.

A Students who own cell phones

B Students who do NOT own cell phones

C Members of the student council

D 3 students randomly selected from each class

25. Two boxes containing multi-coloured straws are shown below.
What is the probability of randomly selecting a blue straw from box 1 and a green straw from box 2?

Box 1

8 red straws

15 blue straws

Box 2

12 green straws

6 yellow straws

9 white straws

A $\frac{27}{50}$

B $\frac{20}{69}$

C $\frac{9}{125}$

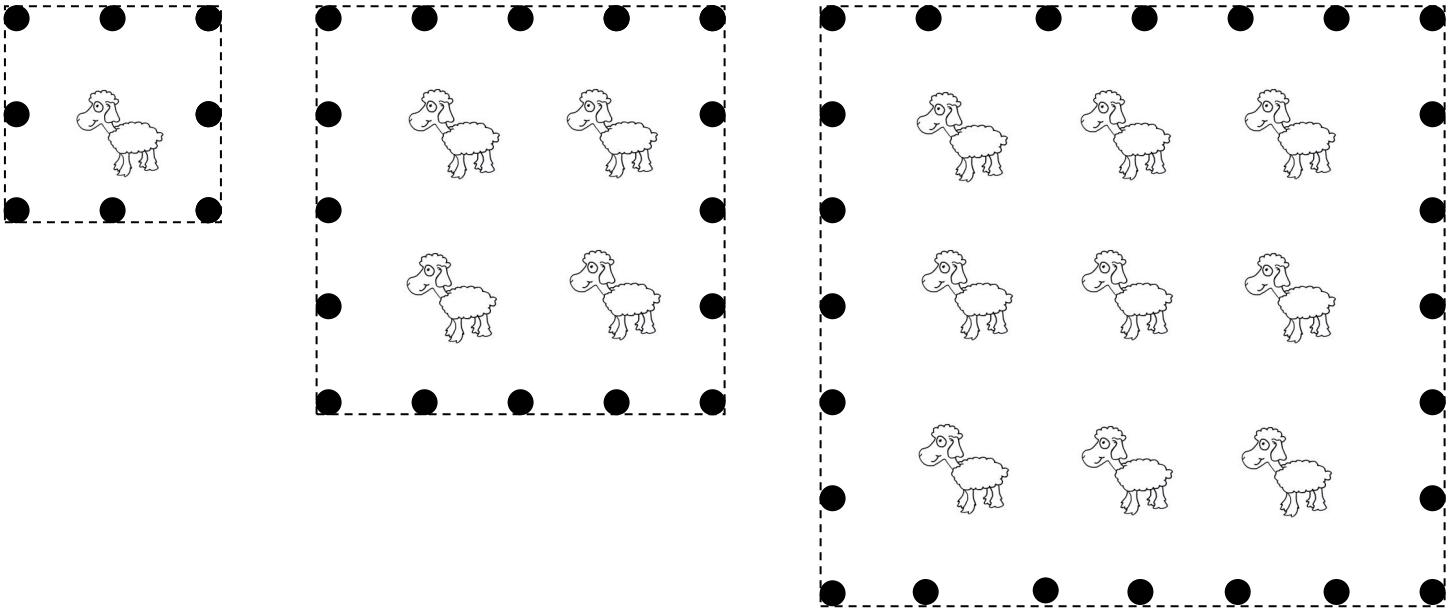
D $\frac{32}{207}$

Problem Solving – Written Response

Show all your thinking (charts, tables, diagrams, calculations, etc. and a complete answer).

26. A rancher contains his sheep by building square pens. The diagram below shows the relationship between the number of fence posts needed for the number of sheep contained. If the pattern continues, how many fence posts will be needed to contain 900 sheep?

    Show your work.

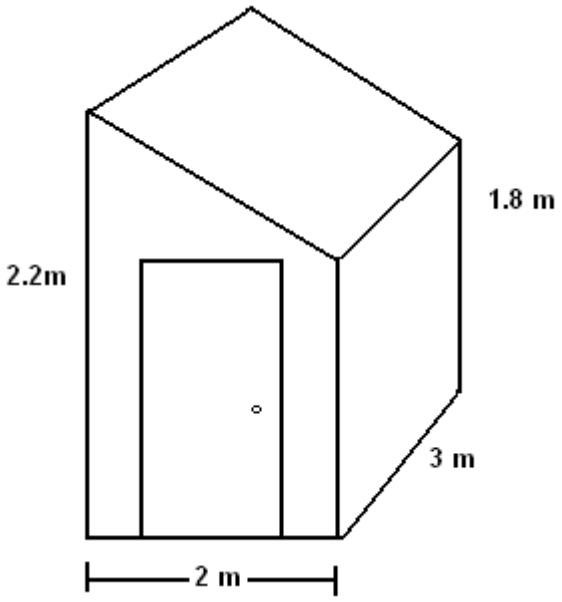


27. A swimming pool is filled by means of three pipes. The first pipe can fill the pool in eight hours, the second can fill the pool in twelve hours, and the third pipe can fill the pool in twenty-four hours. When all three pipes are in use at the same time, how long does it take to fill the pool?

    Show your work.

28. Kerry is building a bike shed. Excluding the floor and including the door, what is the surface area of the shed?

Show your work.



29. Kim's cellular phone requires a 3 digit code before it can be operated. She can't remember her code but she does know that:
    - the digits are in order from least to greatest
    - the digits add to her age of 14
    - none of the digits repeat

    Given the previous information, what is the probability Kim will enter the correct code on her first attempt?

    Show your work.

Grade 9 Math Computations: No Calculators Allowed

Write one billion as a power of 10.	Simplify: $\dfrac{(2\times10^5)}{(8\times10^2)}$
Simplify: $-2\frac{1}{2}+3\frac{1}{3}$	Simplify: $\sqrt{1.21}$
Simplify: $\dfrac{5+2(7-5)^2}{5+2^2}$	Simplify: $\sqrt{25+\sqrt{121}}$
Simplify: $\dfrac{-2^4}{-2}$	Simplify: 5^0
Simplify: $9+\left(\frac{1}{2}\right)^3 \div 4$	Simplify: $-1\frac{2}{3} \times 2\frac{1}{4}$

Grade 9 Math Computations: No Calculators Allowed

Simplify: $-2x(5+3x^2)$	Simplify: $(3x^2+5x+7)-(2x^2-4x+9)$
Expand: $(5x+1)(6x)$	Simplify: $\left(\frac{3a}{4b^2}\right)\div\left(\frac{c^2}{2d}\right)$
Simplify: $\frac{12x^2+16x+8}{4}$	Simplify: $5x^2-10x+3x^2+32-29x$
Complete: $(4x^2+6x-2)+$ ☐ $=7x^2-2x+4$	Evaluate $4x^2+3y$ if $x=-3$ and $y=-8$
Solve: $3(x+2)=x(1-6)$	Solve: $3x-2=5x+8$

Answer Key

1. B (Number) square root
2. B (Number) powers
3. A (Number) order of operations
4. A (Number) exponents
5. A (Number) evaluate exponential expression
6. D (Number) order rational numbers
7. C (Number) order of operations
8. B (Number) square root
9. A ((Number) square root
10. C (Patterns & Relations) rational problems
11. B (Patterns & Relations) adding polynomials
12. C (Patterns & Relations) equivalent inequalities
13. A (Patterns & Relations) diagram for an equation
14. C (Patterns & Relations) solve an in-context equation
15. B (Patterns & Relations) identify parts of a polynomial
16. C (Patterns & Relations) analyze a linear graph
17. D (Shape & Space) circle properties
18. A (Shape & Space) surface area
19. C (Shape & Space) similar triangles
20. A (Shape & Space) congruent triangles
21. B (Shape & Space) scale reduction
22. B (Shape & Space) translation
23. C (Statistics & Probability) ethics
24. D (Statistics & Probability) sample
25. B (Statistics & Probability) understanding probability

26. 240 fence posts.

1	2	3	4
▪ A start beyond copying that shows some understanding.	▪ Correct answer but no work shown. or ▪ Appropriate strategy but not carried out far enough.	▪ Correct answer but unclear strategy. or ▪ Appropriate strategy but ignored a condition.	▪ Correct answer with clear strategy. or ▪ Incorrect solution with a copy error or minor computation error but not a misunderstanding.

27. 4 hours

1	2	3	4
▪ A start beyond copying that shows some understanding of shared work.	▪ Correct answer but no work shown. or ▪ Appropriate strategy but not carried out far enough.	▪ Correct answer but unclear strategy. or ▪ Appropriate strategy but ignored a condition.	▪ Correct answer with clear strategy. or ▪ Incorrect solution with a copy error or minor computation error but not a misunderstanding.

28. Total SA = 26.12 m^2
    Front = 4 m^2
    Back = 4 m^2
    Left wall = 6.6 m^2
    Right wall = 5.4 m^2
    Roof = 2.04 x 3 = 6.12 m^2

1	2	3	4
▪ A start beyond copying that shows some understanding. ▪	▪ Correct answer but no work shown. or ▪ Appropriate strategy but not carried out far enough but has attempted to calculate areas	▪ Correct answer but unclear strategy. or ▪ Appropriate strategy but ignored a condition. – used 2m for roof width instead of applying Pythagorean theorem to get a width of 2.04m and a total SA incorrectly = 26.0 m^2	▪ Correct answer with clear strategy. or ▪ Incorrect solution with a copy error or minor computation error but not a misunderstanding.

29. $\frac{1}{10}$ or 10% or 0.1

Combinations: 059, 068, 149, 158, 167, 239, 248, 257, 347, 356

1	2	3	4
▪ A start beyond copying that shows some understanding of shared work.	▪ Correct answer but no work shown. or ▪ 4 to 9 combinations with no probability.	▪ Correct answer but unclear strategy. or ▪ All 10 combinations with no probability. or ▪ 6 to 9 combinations with probability.	▪ Correct answer with clear strategy. or ▪ Incorrect solution with a copy error or minor computation error but not a misunderstanding.

Basic Math Computations

10^9	250 or 2.5 x 10^2
$\frac{5}{6}$	1.1
$\frac{13}{9}$ *or* $1\frac{4}{9}$	6
8	1
$9\frac{1}{32}$	$-3\frac{3}{4}, -\frac{15}{4}$, -3.75
$-10x-6x^3$ *or* $-6x^3-10x$	x^2+9x-2
$30x^2+6x$	$\frac{3ad}{2b^2c^2}$
$3x^2+4x+2$	$8x^2-39x+32$
$3x^2-8x+6$	12
$-\frac{3}{4}$ or -0.75	–5