Read the instructions below.

Along with this booklet, make sure you have the Answer Booklet and the Formula Sheet.

You may use any space in this book for rough work for multiple-choice questions only.

The diagrams in these booklets are not all drawn to scale.

ATTENTION:

Unlike in the actual assessment booklet, the questions in this booklet are sorted by strand.

There are more multiple-choice questions in this booklet than in a regular booklet.

Continue to read the directions on the cover of the Answer Booklet.
1. A rectangle is divided into 5 equal sections as pictured below.

Which of the following represents the area of one section?

a. $8x$

b. $8x^2$

c. $15x$

d. $15x^2$

2. The table below contains five expressions.

| $p \times p \times p \times p \times p \times p$ |
| $p^2 \times p^2 \times p^2$ |
| $p^2 \times p^3$ |
| $p^5$ |
| $p^6$ |

How many of these expressions are equivalent to $(p^2)^3$?

a. 1

b. 2

c. 3

d. 4

3. A rectangle is shown below with algebraic expressions for its length and width in centimetres.

Which expression represents the area of the rectangle in cm$^2$?

a. $4x + 5$

b. $8x + 10$

c. $3x^2 + 5$

d. $3x^2 + 15x$
4. What is the solution to the equation below?
\[
\frac{2}{3}x - 4 = 20
\]
\[
\frac{2}{3}x = 24
\]
\[
x = 36
\]

5. Mia sells T-shirts from a booth at a market. She pays $30 to rent the booth. Each T-shirt costs her $1.50, and she sells them for $7.50 each.

Her goal is to make $200 after she pays for the booth and the T-shirts.

What is the minimum number of T-shirts Mia must sell to reach her goal?

\[
200 = 7.50x - 1.50x - 30
\]
\[
200 = 6x - 30
\]
\[
230 = 6x
\]
\[
x = 38.3
\]

6. Joanne drives for 2.5 hours at a constant speed and travels 250 km.

François drives at a constant speed exactly 10 km/h less than Joanne’s speed.

Which point on the graph below could represent the distance travelled and time spent travelling for François?

Joanne’s speed:
\[
\frac{250 \text{ km}}{2.5 \text{ h}} = 100 \text{ km/h}
\]

François speed:
\[
100 - 10 = 90 \text{ km/h}
\]

Distance travelled (km)

Time spent travelling (h)

If she sells 39, she will be over $200.
7. Which of the following shows information from a linear relation between $C$ and $n$?

a) \[
\begin{array}{c|c}
 n & C \\
\hline
0 & 0 \\
1 & 1 \\
2 & 3 \\
\end{array}
\]

b) \[
\begin{array}{c|c}
 n & C \\
\hline
0 & -7 \\
2 & -5 \\
4 & -3 \\
\end{array}
\]

c) \[
\begin{array}{c|c}
 n & C \\
\hline
0 & -9 \\
4 & -6 \\
16 & -3 \\
\end{array}
\]

d) \[
\begin{array}{c|c}
 n & C \\
\hline
0 & 2 \\
5 & 4 \\
20 & 6 \\
\end{array}
\]

8. The total cost of yearbooks for a school is made up of a $375 set-up fee and $25 for each yearbook purchased.

There is a linear relationship between the total cost and the number of yearbooks purchased.

What type of variation is this relationship, and what is its initial value?

a) direct variation, $375
b) direct variation, $25
c) partial variation, $375
d) partial variation, $25
A company ships CDs in crates of equal size. The graph below shows the relationship between the total mass of a crate and the number of CDs it contains.

Total Mass vs. Number of CDs

Which of the following equations represents the relationship between the total mass of a crate, $M$, and the number of CDs it contains, $n$?

- **a** $M = 0.25n + 100$
- **b** $M = 4n + 100$
- **c** $M = 0.25n + 125$
- **d** $M = 4n + 125$

A relationship is represented by the following graph.

Which equation represents this relationship?

- **a** $C = n + 2$ ✔
- **b** $C = n + 1$
- **c** $C = 2n + 2$
- **d** $C = 2n + 1$

A local band pays $5000 to record its first album and $0.15 for each CD made.

The band pays $7000 to record its second album and $0.10 for each CD made.

How will the graph of the relationship between the total cost and the number of CDs made for the second album differ from the graph for the first album?

The graph of the line for the second album will start

- **a** lower on the vertical axis and be steeper.
- **b** higher on the vertical axis and be steeper.
- **c** lower on the vertical axis and be less steep.
- **d** higher on the vertical axis and be less steep.
Go to the Answer Booklet and complete the seven open-response questions before continuing with question 19.

12 Open-Response
13 Open-Response
14 Open-Response
15 Open-Response
16 Open-Response
17 Open-Response
18 Open-Response

19 Which equation does not represent a linear relation?

a $y = 0$

b $x = 5$

c $x + y = 9$

d $2x + y - 5 = 0$

20 What is the slope of the line represented by the equation below?

$0 = 2x - 10y + 7$

a $5$

b $\frac{1}{5}$

c $-\frac{1}{5}$

d $-5$
31. The end points of line segment AB are A(3, -12) and B(6, k).

What is the value of k if the slope of line segment AB is -2?

- a -18
- b -6
- c 6
- d 18

\[ m = \frac{y_2 - y_1}{x_2 - x_1} \]
\[ -2 = \frac{k - (-12)}{6 - 3} \]
\[ -2 = \frac{k + 12}{3} \]
\[ -6 = k + 12 \]
\[ -18 = k \]

22. Information about three different relationships between C, in dollars, and t, in hours, is shown below.

<table>
<thead>
<tr>
<th>t (h)</th>
<th>C ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>1</td>
<td>14</td>
</tr>
<tr>
<td>2</td>
<td>18</td>
</tr>
</tbody>
</table>

\[ \frac{\Delta y}{\Delta t} = \frac{\text{rise}}{\text{run}} \]
\[ m = \frac{y_2 - y_1}{x_2 - x_1} \]
\[ \frac{18 - 14}{4 - 2} = \frac{4 - 2}{2} = \frac{1}{2} = 2 \]

\[ C = 4 + 0.5t \]

How many of the three relationships between C and t have a rate of change of $4 per hour?

- a 0
- b 1
- c 2
- d 3
A line passes through the point (6, 4) and has a slope of $-\frac{1}{2}$.

Which of the following graphs represents this line?

- **a**
- **b**
- **c**
- **d**
24. The maximum number of tickets that can be sold for a school play is 350.

The total profit earned, \( P \), can be determined using the equation \( P = 4.50n - 1080 \), where \( n \) is the total number of tickets sold.

Which of the following statements is true?

a) The maximum profit is $1080.  

b) The maximum profit is $1575.  

c) The total profit is $0 when 240 tickets are sold.  

d) The total profit is $0 when 350 tickets are sold.

\[
P = 4.50(350) - 1080 = 1575 - 1080 = 495 \text{ (max profit)}
\]

For 4 classes, both gyms have the same total cost.

Which of the following could represent the total cost for the second gym?

a) \( C = 60 + 4n \)  

b) \( C = 40 + 15n \)  

c) The total cost is made up of a membership fee of $60 and $10 per class.  

d) The total cost is made up of a membership fee of $40 and $20 per class.
26. The table below lists the widths of four rectangles, each with an area of 72 cm².

<table>
<thead>
<tr>
<th>Width (cm)</th>
<th>Rectangle 1</th>
<th>Rectangle 2</th>
<th>Rectangle 3</th>
<th>Rectangle 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6</td>
<td>8</td>
<td>10</td>
<td>18</td>
</tr>
</tbody>
</table>

Which rectangle has the smallest perimeter?

- a. Rectangle 1: \( P = 2(6) + 2(12) = 36 \)
- b. Rectangle 2: \( P = 2(8) + 2(9) = 34 \)
- c. Rectangle 3: \( P = 2(10) + 2(7.2) = 34.4 \)
- d. Rectangle 4: \( P = 2(18) + 2(4) = 44 \)

27. Salt is sold in packages in the shape of a rectangular-based prism that is not a cube. A new package in the shape of a cube is designed to contain the same volume.

Which of the following is true about the new package?

- a. It holds less salt.
- b. It holds more salt.
- c. It requires less material.
- d. It requires more material.

The cylinder has a volume of 96 cm³.

What is the volume of the figure?

- a. 120 cm³
- b. 128 cm³
- c. 144 cm³
- d. 192 cm³
Consider the diagram below.

What is the value of $x$?

a) 61°

b) 68°

c) 112°

d) 119°

The following figure is a 15-sided regular polygon.

What is the value of $x$ shown in the diagram?

a) 24°

b) 34°

c) 46°

d) 48°
Grade 9 Assessment of Mathematics
2014

Released Assessment Questions: Academic

Student Answer Sheet

Your multiple-choice answers must be entered on this sheet.

• To indicate your answer, use a pencil to fill in the circle completely.
  
  Like this: •  Not like this: ○ □ △ ▲

• Do not fill in more than one answer to a question.
• Do not leave a question blank.
• Cleanly erase any answer you wish to change and fill in the circle for your new answer.

1. a b c d
2. a b c d
3. a b c d
4. a b c d
5. a b c d
6. Respond in booklet.
7. a b c d
8. a b c d
9. a b c d
10. a b c d
11. a b c d
12. a b c d
13. Respond in booklet.
15. a b c d
16. a b c d
17. a b c d
18. a b c d
19. a b c d
20. a b c d
21. a b c d
22. Respond in booklet.
23. Respond in booklet.
24. a b c d
25. a b c d
26. a b c d
27. a b c d
28. a b c d
29. a b c d
30. Respond in booklet.
31. Respond in booklet.

End of Assessment

Print Student Name: ____________________________

Student Signature: ____________________________