Practice Quiz 7

Instructions

Please answer **all 60 multiple-choice questions** in this quiz.

When you are finished, click **Submit**. Your results will appear immediately, along with the **correct answers** so you can review your work and learn from any mistakes.

Good luck!

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✉ Not shared

* Indicates required question

Full Name *

Your answer

Name of School *

Your answer

*   1 point

1. $(-3)^2 + (-2)^2$ is equal to

(A) −13
(B) −10
(C)   5
(D)   13

○ A

○ B

○ C

○ D

*   1 point

2. What is the value of the digit 2 in the number 48.621?

(A) $\dfrac{2}{100}$

(B) $\dfrac{2}{10}$

(C)   2

(D)   200

○ A

○ B

○ C

○ D

---

*   1 point

3. What number when added to $1\frac{1}{3}$ gives 2?

(A) $\dfrac{1}{3}$

(B) $\dfrac{2}{3}$

(C)   1

(D)   3

○ A

○ B

○ C

○ D

---

*   1 point

4. The next term in the sequence

1, 6, 13, 22, 33, _____ is

(A)   44
(B)   45
(C)   46
(D)   52

○ A

○ B

○ C

○ D

*   1 point

5. If 30% of a number is 45, what is $\frac{4}{5}$ of the number?

(A)   36
(B)   120
(C)   150
(D)   180

○ A

○ B

○ C

○ D

*   1 point

6. A certain amount of money is shared in the ratio 2:3:9. If the difference between the first and second shares is $40, then the amount of money shared is

(A) $280
(B) $360
(C) $400
(D) $560

○ A

○ B

○ C

○ D

*   1 point

7. If $P = \{2, 3, 5, 7\}$,
$Q = \{2, 3, 6\}$ and
$S = \{2, 4, 5\}$,

then $P \cap Q \cap S =$

(A) $\{2\}$
(B) $\{2,3\}$
(C) $\{2, 3, 5\}$
(D) $\{2, 3, 4, 5, 6, 7\}$
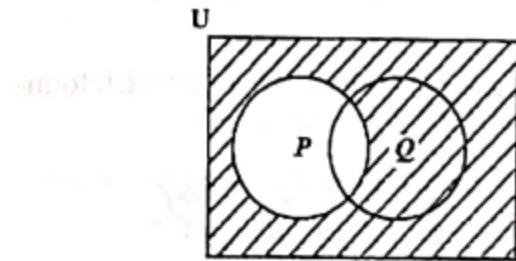
○ A

○ B

○ C

○ D

*   1 point

Item **8** refers to the following Venn diagram.

8.   The shaded region represents

(A) P'
(B)   · $(P \cup Q)'$
(C) $P \cup Q'$
(D) $Q \cap P'$

○ A

○ B

○ C

○ D

---

*   1 point

9.   The elements of the set
        $\{x: 6 \leq x < 10, \text{ where } x \text{ is an integer}\}$ are

(A) $\{7, 8, 9\}$

(B) $\{6, 7, 8, 9\}$

(C) $\{7, 8, 9, 10\}$

(D) $\{6, 7, 8, 9, 10\}$

○ A

○ B

○ C

○ D

*   1 point

Item 10 refers to the following information.

$M = \{p, q, r\}$

$N = \{p, q\}$

10.   Which of the following statements is true?

(A) $M \subset N$

(B) $M \cap N = N$

(C) $M \cup N = N$

(D) $M \cap N = \{\ \}$

○ A

○ B

○ C

○ D

*   1 point

Item 11 refers to the the following informa-
tion which describes 3 sets.

$P = \{\text{Prime numbers}\}$
$Q = \{\text{Odd numbers}\}$
$R = \{\text{Even numbers}\}$

11.   Which of the following sets is empty?

(A) $P \cap R$
(B) $P \cup Q$
(C) $P \cap Q$
(D) $Q \cap R$

○ A

○ B

○ C
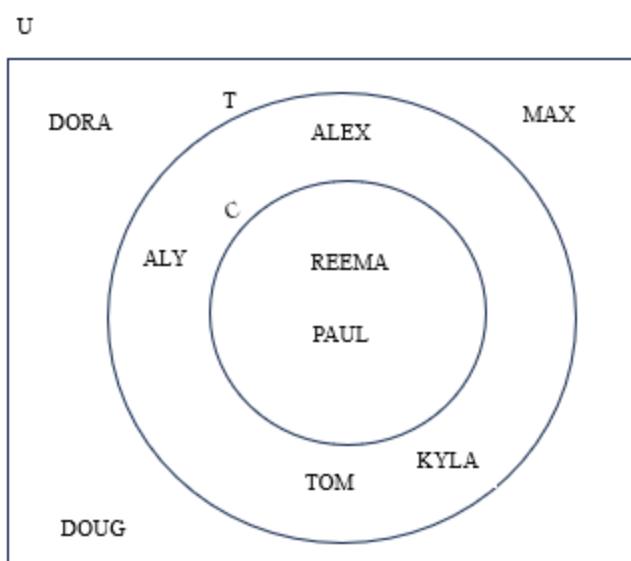
○ D

*   1 point

Item 12 refers to the following Venn diagram which shows the universal set (U) and two
sets T and C, that represents the students in a class who play tennis (T) and chess (C).

U

DORA   T   MAX
                ALEX

        C
    ALY   REEMA

                PAUL

                        KYLA
            TOM
    DOUG

12. How many students play EXACTLY one game?

    (A) 2

    (B) 3

    (c) 4

    (D) 6

○ A

○ B

○ C

○ D

---

*   1 point

13.   A dress which costs $180 is being sold
        at a discount of 10%. The amount of the
        discount is

        (A) $ 1.80
        (B) $ 10.00
        (C) $ 18.00
        (D) $170.00

○ A

○ B

○ C

○ D

*   1 point

14.   The cost of a refrigerator is $1 850.00. If
       a sales tax of 5% is paid on the cost price
       of the refrigerator, a buyer who purchases
       the refrigerator by cash will pay

       (A) $1 350.00
       (B) $1 757.50
       (C) $1 845.00
       (D) $1 942.50

○ A

○ B

○ C

○ D

---

*   1 point

15.   A salesman sells a car for $11 000. If he is
       paid a commission of 4.5% for the first
       $10 000 and 7.5% on the remainder, then
       the commission he receives is

       (A) $ 495
       (B) $ 525
       (C) $ 825
       (D) $1 320

○ A

○ B

○ C

○ D

---

*   1 point

16.   The value of a plot of land is $18 000.00.
       Land tax is charged at the rate of $0.70 per
       $100.00 value. What is the TOTAL amount
       of tax paid for the land?

       (A) $110.00
       (B) $126.00
       (C) $180.70
       (D) $257.15

○ A

○ B

○ C

○ D

*   1 point

17.   A man's basic wage for a 40-hour week is $160.00. He is paid overtime at the rate of $1\frac{1}{4}$ times the hourly rate. If he works $6\frac{1}{2}$ hours overtime in a certain week, his wage for that week is

    (A) $165.00
    (B) $166.50
    (C) $171.50
    (D) $192.50

○ A

○ B

○ C

○ D

*   1 point

18.   At the end of any year a car is worth 5% less than what it was worth at the beginning of the year. If a car was worth $9 500 in December 2016, then its value in January 2016 was

    (A) $ 9 025
    (B) $ 9 995
    (C)   - $10 000
    (D) $10 025

○ A

○ B

○ C

○ D

*   1 point

19.   A loan of $8 000 was repaid in 24 equal monthly instalments of $400. The rate of interest on the loan was

    (A)   5%

    (B) $8\frac{1}{3}\%$

    (C) $16\frac{1}{3}\%$

    (D)   20%

○ A

○ B

○ C

○ D

*   1 point

20. At a sale, each book was marked $3.00 off
the original price. Daniel paid $46.00 for
2 books that had the same sale price. What
was the **original** cost of ONE of his books?

    (A) $20.00
    (B) $21.50
    (C) $24.50
    (D) $26.00

○ A

○ B

○ C

○ D

---

*   1 point

21. $3x^2 \times 2x^3 =$

    (A) $6x^5$
    (B) $5x^5$
    (C) $6x^6$
    (D) $72x^5$

○ A

○ B

○ C

○ D

---

*   1 point

22. If $5(2x - 1) = 35$, then $x =$

    (A) -4

    (B) $\dfrac{1}{4}$

    (C) 3

    (D) 4

○ A

○ B

○ C

○ D

*   1 point

23.   When twice a certain number is subtracted
          from 7 and the result is multiplied by 3, the
          answer is 33. What is the **original** number?

          (A)   −3
          (B)   −2
          (C)   2
          (D)   9

○ A

○ B

○ C

○ D

---

*   1 point

24.   Given that 3 * 6 = 12 and 2 * 5 = 9, then
          $a * b$ may be defined as

          (A) $4(b - a)$
          (B) $a^2 - b$
          (C) $6a - b$
          (D) $2a + b$

○ A

○ B

○ C

○ D

---

*   1 point

25.   If $x = -2, y = 3, t = 2$, then $\left[\dfrac{x}{y}\right]^t =$

          (A) $\dfrac{-4}{9}$

          (B) $\dfrac{4}{9}$

          (C) $\dfrac{4}{3}$

          (D) $\dfrac{9}{4}$

○ A

○ B

○ C

○ D

*   1 point

26.   If $3^{2x+1} = 9(3^x)$, then the value of x is

(A)   0

(B) $\dfrac{1}{3}$

(C)   1

(D)   3

○ A

○ B

○ C

○ D

---

*   1 point

27.   Given that $A = \begin{bmatrix} 1 & 3 & -3 \\ 3 & 0 & 5 \end{bmatrix}$, then $3A$ equals

(A) $\begin{bmatrix} 3 & 9 & -9 \\ 9 & 0 & 15 \end{bmatrix}$

(B) $\begin{bmatrix} 4 & 6 & -6 \\ 6 & 3 & 8 \end{bmatrix}$

(C) $\begin{bmatrix} 3 & 9 & -6 \\ 9 & 0 & 15 \end{bmatrix}$

(D) $\begin{bmatrix} -2 & 0 & 6 \\ 0 & 3 & 2 \end{bmatrix}$

○ A

○ B

○ C

○ D

---

*   1 point

28.   The determinant of the 2×2 identity matrix is

(A)   one
(B)   zero
(C)   undefined
(D)   negative one

○ A

○ B

○ C

○ D

*   1 point

<u>Item 29</u> refers to the following vector **p** and **q**.

$$p = \begin{bmatrix} 3 \\ 7 \end{bmatrix} \qquad q = \begin{bmatrix} -2 \\ 5 \end{bmatrix}$$

29.   The vector **p** – **q** is represented by

(A) $\begin{bmatrix} 1 \\ 12 \end{bmatrix}$

(B) $\begin{bmatrix} 5 \\ 12 \end{bmatrix}$

(C) $\begin{bmatrix} 5 \\ 2 \end{bmatrix}$
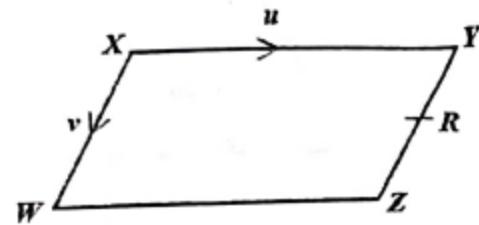
(D) $\begin{bmatrix} 1 \\ 5 \end{bmatrix}$

○ A

○ B

○ C

○ D

---

*   1 point

<u>Item 30</u> refers to the following parallelogram, *WXYZ*. In the parallelogram, $\overrightarrow{XY} = u$ and $\overrightarrow{XW} = v$. *R* is the midpoint of *YZ*.

30. $\overrightarrow{WR}$, expressed in terms of *u* and *v*, is

(A) $u - \dfrac{1}{2}v$

(B) $u + \dfrac{1}{2}v$

(C) $-u + \dfrac{1}{2}v$

(D) $-\dfrac{1}{2}v - u$

○ A

○ B

○ C

○ D

*   1 point

31. Given that 1 millimetre $= \dfrac{1}{1000}$ metres,

then 2 500 millimetres, in metres, is

(A)   0.25
(B)   2.5
(C)   25
(D)   250

- ○ A
- ○ B
- ○ C
- ○ D

---

*   1 point

32. The volume, in cm³, of a cube of edge 3 cm
is

(A)   9
(B)   18
(C)   27
(D)   54

- ○ A
- ○ B
- ○ C
- ○ D

---

*   1 point

**33.** The perimeter of a square is 48 cm. What
is its area, in cm²?

(A)   36
(B)   72
(C)   108
(D)   144
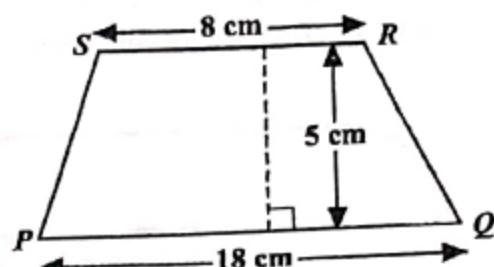
- ○ A
- ○ B
- ○ C
- ○ D

*   1 point

Item 34 refers to the following diagram of
a trapezium.

34.   The area of the trapezium, $PQRS$, above is
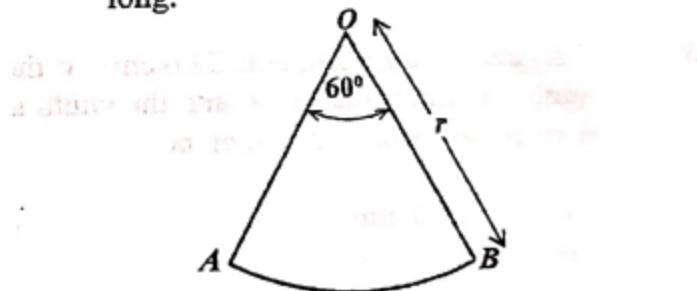
    (A)   45 cm²
    (B)   65 cm²
    (C)   90 cm²
    (D)   130 cm²

◯ A

◯ B

◯ C

◯ D

*   1 point

Item 35 refers to the following diagram
which shows a sector of a circle, AOB.
$AOB = 60°$ and the radius OB is r units
long.

35.   The area of AOB is

    (A) $\frac{1}{6}\pi r^2$

    (B) $\frac{1}{6}\pi r$

    (C) $\frac{1}{3}\pi r^2$

    (D) $\frac{1}{3}\pi r$
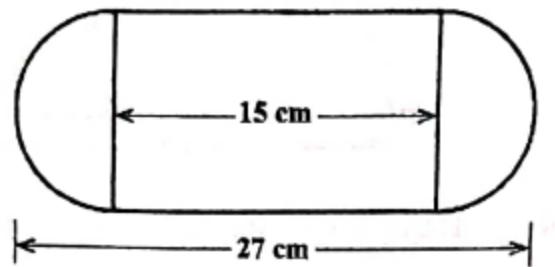
◯ A

◯ B

◯ C

◯ D

*   1 point

Item 36 refers to the following diagram
which shows a compound shape made up of
a rectangle and two identical semi-circles,
one on either of the short sides.

36.   The perimeter of the figure above, in terms
        of π, is

        (A) $6(5 + \pi)$
        (B) $6(9 + \pi)$
        (C) $6(5 + 2\pi)$
   (D) $6(9 + 2\pi)$

○ A

○ B

○ C

○ D

---

*   1 point

37.   The area of a rectangle is 53.6 cm². If the
        length is multiplied by 4 and the width is
        halved, the area would then be

        (A)   26.8 cm²
        (B)   53.6 cm²
        (C)   107.2 cm²
        (D)   214.4 cm²
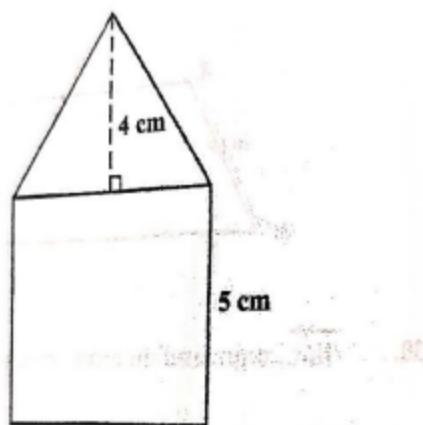
○ A

○ B

○ C

○ D

*   1 point

Item 38 refers to the following diagram, which consists of a triangle resting on a square of side 5 cm.

38.   If the height of the triangle is 4 cm, what is the TOTAL area of the figure?

    (A)   35 cm²
    (B)   45 cm²
    (C)   50 cm²
    (D)   100 cm²

○ A

○ B

○ C

○ D

---

39 *   1 point

- ソ -

Items **39** and **40** refer to the following frequency distribution which shows the average mass, in kg, of a group of children in a school.

Mass (kg)	21–30	31–40	41–50	51–60	61–70
Frequency	28	40	12	34	18

39.   The number of children who have a mass ≤ 40 kg is

    (A)   15
    (B)   40
    (C)   64
    (D)   68

40.   The upper boundary of the median class is

    (A)   30.5
    (B)   40.5
    (C)   50.5
    (D)   60.5

○ A

○ B

○ C

○ D

40 *

1 point

- 9 -

Items **39** and **40** refer to the following frequency distribution which shows the average mass, in kg, of a group of children in a school.

Mass (kg)	21–30	31–40	41–50	51–60	61–70
Frequency	28	40	12	34	18

39. The number of children who have a mass ≤ 40 kg is

(A) 15
(B) 40
(C) 64
(D) 68

40. The upper boundary of the median class is

(A) 30.5
(B) 40.5
(C) 50.5
(D) 60.5

○ A

○ B

○ C

○ D

---

*   1 point

41. Ms Clarke arranged the 15 test scores of her students in order of size and selected the 8th score for reporting purposes. Which of the following statistical measures did Ms Clarke obtain?
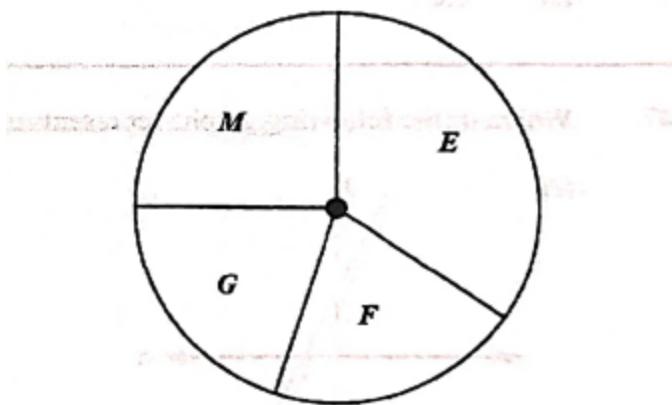
(A) Mean
(B) Mode
(C) Range
(D) Median

○ A

○ B

○ C

○ D

1 point

42. The pie chart below, **drawn to scale**, shows how a student used 12 hours in studying English (E), Mathematics (M), French (F) and Geography (G).

The amount of time spent studying Mathematics is APPROXIMATELY

(A)   1 hour
(B)   2 hours
(C)   3 hours
(D)   4 hours

○ A

○ B

○ C

○ D

---

*   1 point

43. If the mean of the FOUR numbers 4, 8, x and 12 is 10, then x is

(A)   4
(B)   10
(C)   12
(D)   16

○ A

○ B

○ C

○ D

*   1 point

Item 44 refers to the following table which shows the results of a survey of 100 persons, from 2 major ethnic groups, P and R. Respondents were interviewed about their attitude towards Mathematics.

Attitude Towards Mathematics	Ethnicity		Total
	P	R	
Positive	25	12	37
Neutral	11	9	20
Negative	24	19	43
Total	60	40	100

44.   A respondent is selected at random. What is the probability that he has a positive attitude towards Mathematics?

(A)   0.20
(B)   0.37
(C)   0.43
(D)   0.60

○ A

○ B

○ C

○ D

---

*   1 point

45.   The point where a linear function crosses the horizontal axis is

(A)   the x-intercept
(B)   the y-intercept
(C)   always positive
(D)   always negative

○ A

○ B

○ C

○ D

*   1 point

46. The equation of the straight line whic
passes through the point (0, 5) and has
gradient of 4 is

    (A) $y = 4x$
    (B) $y = 5x$
    (C) $y = 4x + 5$
    (D) $y = 5x + 4$
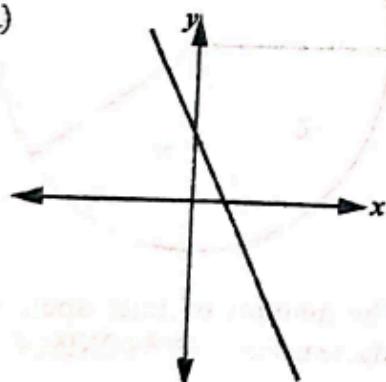
○ A

○ B

○ C

○ D
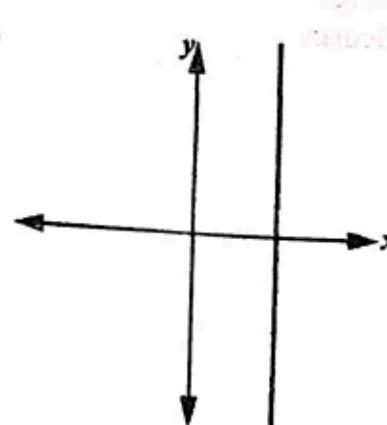
*   1 point

**47.** Which of the following graphs represents a linear function?
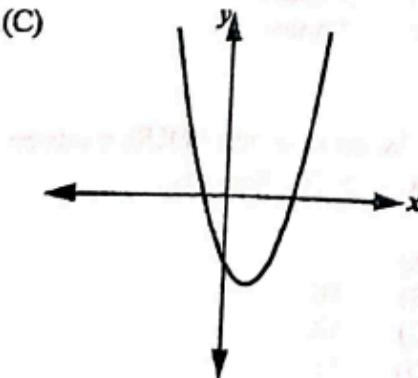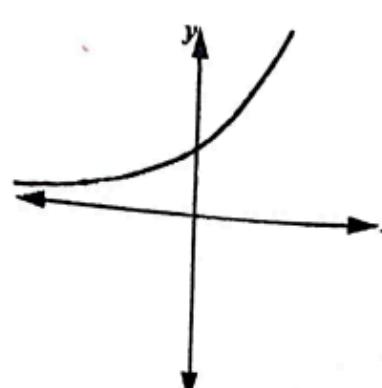
(A)   (B)   (C)   (D)
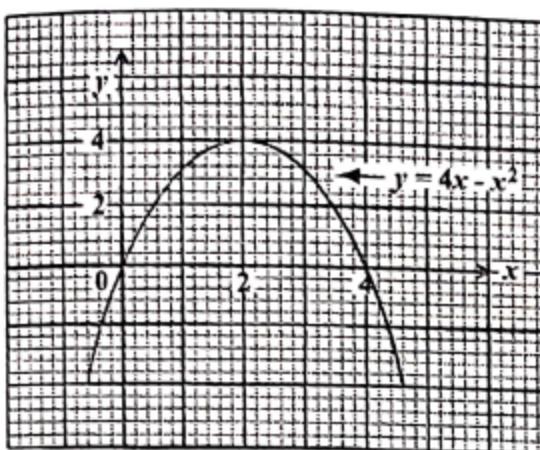
○ A

○ B

○ C

○ D

*   1 point

Item **48** refers to the following graph of a quadratic function.

48.   The coordinates of the maximum point of the function $y = 4x - x^2$ are

(A)   (2, 4)
(B)   (0, 4)
(C)   (4, 2)
(D)   (4, 4)

○ A

○ B

○ C

○ D

---

*   1 point

49.   A line L is parallel to the line

$$3x - 7y - 9 = 0.$$

What is the gradient of the line L?

(A) $-\dfrac{7}{3}$

(B) $-\dfrac{9}{7}$

(C) $\dfrac{3}{7}$

(D) $\dfrac{7}{3}$

○ A

○ B

○ C

○ D

*   1 point

50.   If $g(x) = \dfrac{7x-3}{5}$, then $g(-6) =$

     (A) -9

     (B) $-\dfrac{39}{5}$

     (C) $\dfrac{39}{5}$

     (D) 9

- ( ) A
- ( ) B
- ( ) C
- ( ) D

*   1 point

51.   The range of $f: x \rightarrow x^3$ for the domain $\{-2, -1, 0, 1, 2\}$ is

     (A) $\{8, 1, 0, 1, 8\}$
     (B) $\{6, 3, 0, 3, 6\}$
     (C) $\{-6, -3, 0, 3, 6\}$
     (D) $\{-8, -1, 0, 1, 8\}$

- ( ) A
- ( ) B
- ( ) C
- ( ) D

*   1 point

52.   Which of the following pairs of lines is perpendicular?

     (A) $2y = -3x - 8$
            $3x - 2y = -8$

     (B) $y = 2x + 1$
            $y = 2x - 6$

     (C) $y = -4x + 10$
            $4y = x + 1$

     (D) $x - 2y = -1$
            $3x + 5y = 8$

- ( ) A
- ( ) B
- ( ) C
- ( ) D

*   1 point

53. If the sum of the interior angles of a polygon is 4 right angles, then the polygon is a
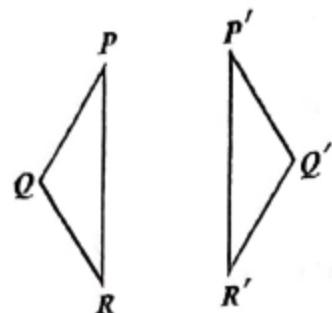
  (A)   triangle
  (B)   hexagon
  (C)   pentagon
  (D)   quadrilateral

○ A

○ B

○ C

○ D

---

*   1 point

Item **54** refers to the following diagram of a transformation.

54. What transformation maps PQR onto $P'Q'R'$?

  (A)   Rotation
  (B)   Reflection
  (C)   Translation
  (D)   Enlargement
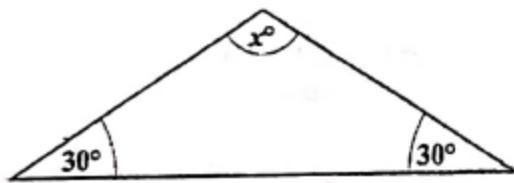
○ A

○ B

○ C

○ D

*   1 point

Item 55 refers to the following diagram of
an isosceles triangle.

55.   In the triangle, the value of x is
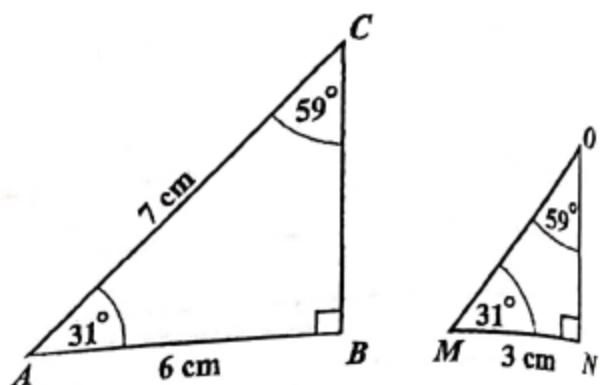
(A)   30°
(B)   60°
(C)   120°
(D)   150°

○ A

○ B

○ C

○ D

*   1 point

Item 56 refers to the following pair of
similar triangles.

56.   The length of MO, in cm, is

(A)   2.5
(B)   3.0
(C)   3.5
(D)   7.0

○ A

○ B

○ C

○ D

* 1 point

57. The image of a point $P(1, 2)$ under a translation is P' $(-5, -4)$. What is the translation vector?

(A) $\begin{pmatrix} -6 \\ -6 \end{pmatrix}$

(B) $\begin{pmatrix} -4 \\ -2 \end{pmatrix}$

(C) $\begin{pmatrix} 4 \\ 2 \end{pmatrix}$

(D) $\begin{pmatrix} 6 \\ 6 \end{pmatrix}$

○ A

○ B

○ C

○ D

* 1 point

58. A plane is flying in a direction of $045°$ and changes course in a clockwise direction to $135°$. The angle through which the plane turns is

(A) $45°$
(B) $90°$
(C) $135°$
(D) $270°$

○ A

○ B

○ C

○ D
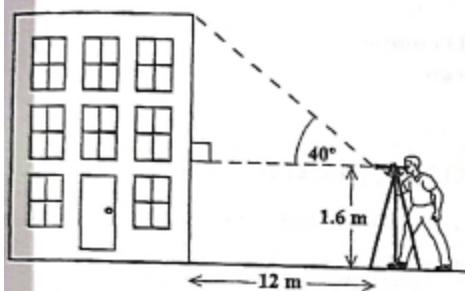
*   1 point

Item 59 refers to the following diagram of a building.

A surveyor sets up his instruments 12 metres from the foot of the building and records the angle of elevation of the top of the building.


59.   An estimate of the height of the building can be obtained by calculating
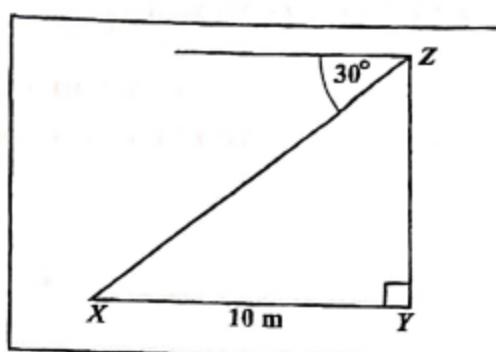
(A) $1.6 + 12 \cos 40°$
(B) $1.6 + 12 \tan 40°$
(C) $(12 \tan 40°) - 1.6$
(D) $(12 \sin 40°) - 1.6$

○ A

○ B

○ C

○ D

---

*   1 point

Item 60 refers to the following diagram.

60.   The diagram above shows that the angle of depression of a point X from Z is 30°. If X is 10 metres from Y, the height of YZ, in metres, is

(A) $10 \tan 30°$
(B) $10 \sin 30°$
(C) $10 \cos 30°$
(D) $10 \cos 60°$

○ A

○ B

○ C

○ D

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