NORTHWEST TERRITORIES FOUNDATIONS OF MATHEMATICS 12 (MFOM-12) · UNIT A · 25 QUESTIONS

Geometry: Conics and Fractals — Practice Test

This practice test was made by AI and there may be mistakes. If a question or answer looks wrong, use the Flag a mistake button to let Brett know so he can fix it.

1 **The vertex of the parabola $y = 2(x - 3)^2 - 1$ is**

- A (3, -1)
- B (-3, -1)
- C (3, 1)
- D (-3, 1)

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2 **The vertex of the parabola $y = x^2 - 6x + 5$ is**

- **A** (3, 4)
- **B** (3, -4)
- **C** (-3, -4)
- **D** (6, 5)

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3 **The parabola $y = -3x^2 + 2x - 1$ opens**

- **A** Upward
- **B** To the right
- **C** Downward
- **D** To the left

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4 For the circle $(x - 2)^2 + (y + 5)^2 = 36$, the centre and radius are

- A (2, 5), 6
- B (2, -5), 36
- C (-2, -5), 6
- D (2, -5), 6

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5 The equation of the circle with centre (0, 0) and radius 5 is

- A $x^2 + y^2 = 5$
- B $x^2 + y^2 = 25$
- C $x^2 - y^2 = 25$
- D $(x - 5)^2 + y^2 = 0$

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6 The equation of the circle with centre (-1, 3) and radius 4 is

- A $(x - 1)^2 + (y - 3)^2 = 16$
- B $(x + 1)^2 + (y + 3)^2 = 16$
- C $(x + 1)^2 + (y - 3)^2 = 16$
- D $(x + 1)^2 + (y - 3)^2 = 4$

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7 The length of the major axis of $\frac{x^2}{25} + \frac{y^2}{9} = 1$ is

- A 5
- B 9
- C 10
- D 18

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8 The vertices of the ellipse $\frac{x^2}{16} + \frac{y^2}{4} = 1$ are

A (± 4, 0)

B (0, ± 4)

C (± 2, 0)

D (0, ± 2)

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9 The foci of the ellipse $\frac{x^2}{25} + \frac{y^2}{9} = 1$ are

A (0, ± 5)

B (± 5, 0)

C (0, ± 4)

D (± 4, 0)

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10 The vertices of the hyperbola $\frac{x^2}{9} - \frac{y^2}{16} = 1$ are

- A $(0, \pm 3)$
- B $(\pm 4, 0)$
- C $(\pm 3, 0)$
- D $(0, \pm 4)$

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11 The asymptotes of the hyperbola $\frac{x^2}{9} - \frac{y^2}{16} = 1$ are

- A $y = \pm \frac{3}{}$
- B $y = \pm \frac{4}{}$
- C $y = \pm \frac{16}{}$
- D $y = \pm \frac{3}{}$

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12 The length of the transverse axis of $\frac{y^2}{36} - \frac{x^2}{9} = 1$ is

- A 6
- B 9
- C 12
- D 18

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13 The focus of the parabola $y^2 = 12x$ is

- A (0, 3)
- B (3, 0)
- C (-3, 0)
- D (12, 0)

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14 **The directrix of the parabola $x^2 = -8y$ is**

- A $y = -2$
- B $x = 2$
- C $y = 2$
- D $x = -2$

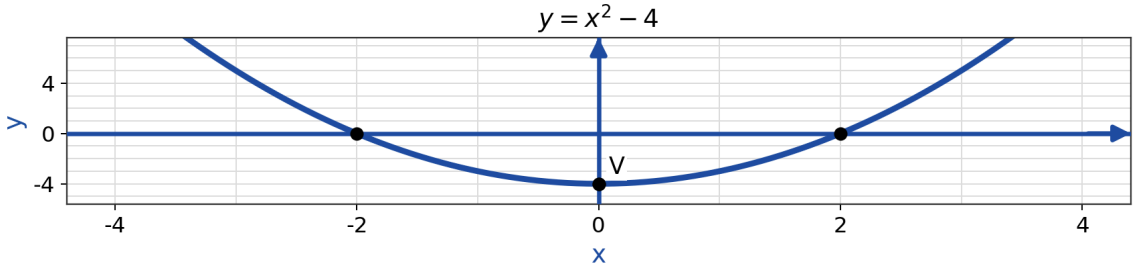
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15 **The conic $9x^2 + 9y^2 = 81$ is a**

- A circle
- B ellipse
- C parabola
- D hyperbola

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16 **The graph shows the parabola y = x² - 4. Its vertex, marked V, is**



A (0, 4)

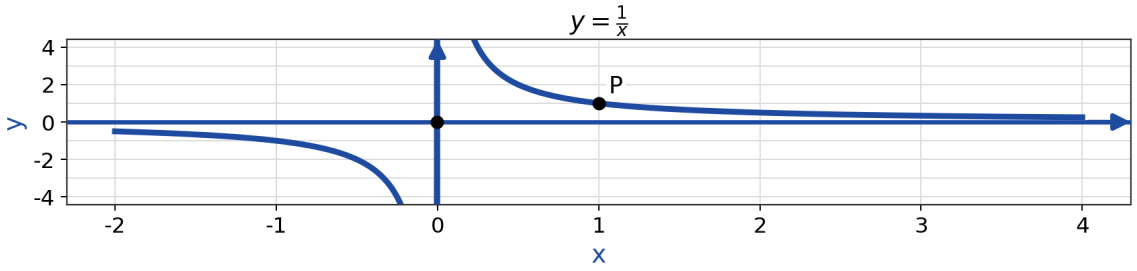
B (-4, 0)

C (0, -4)

D (4, 0)

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17 The graph shows $y = \frac{1}{x}$. The value of y at the point P is



A 0

B 1

C -1

D 2

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18 A Koch figure starts with 3 segments. Each step multiplies the segment count by 4. After 2 steps, the number of segments is ____.

ANSWER _____

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19 **A Sierpinski figure starts with 1 shaded triangle. Each step triples that count. After 3 steps, the number of shaded triangles is ____.**

ANSWER _____

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20 **A self-similar shape is one that**

A has no repeating pattern

B repeats its pattern at smaller scales

C changes completely when enlarged

D is made only of straight lines

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21 **A Koch curve of length 12 is redrawn once. Each segment is replaced by 4 segments each one third as long. The new total length is ____.**

ANSWER _____

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22 **The y-intercept of the parabola $y = 2x^2 - 3x + 5$ is ____.**

ANSWER _____

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23 **The length of the minor axis of $\frac{x^2}{49} + \frac{y^2}{36} = 1$ is**

A 6

B 12

C 14

D 18

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24 The centre of the hyperbola $\frac{(x - 1)^2}{4} - \frac{(y + 2)^2}{9} = 1$ is

A (1, 2)

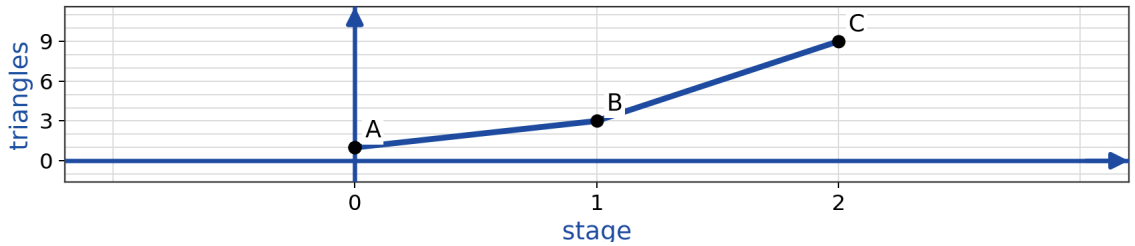
B (-1, -2)

C (-1, 2)

D (1, -2)

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25 The graph shows the number of shaded triangles at each stage of a Sierpinski figure. The number at stage 2 is



A 3

B 6

C 9

D 27

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ANSWER KEY

1.	A	**10.**	C	**19.**	27
2.	B	**11.**	B	**20.**	B
3.	C	**12.**	C	**21.**	16
4.	D	**13.**	B	**22.**	5
5.	B	**14.**	C	**23.**	B
6.	C	**15.**	A	**24.**	D
7.	C	**16.**	C	**25.**	C
8.	A	**17.**	B		
9.	D	**18.**	48		

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