BRITISH COLUMBIA 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** $(0, \pm 5)$
- **B** $(\pm 5, 0)$
- **C** $(0, \pm 4)$
- **D** $(\pm 4, 0)$

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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 $y = \pm \frac{3}{4}x$

B $y = \pm \frac{4}{3}x$

C $y = \pm \frac{16}{9}x$

D $y = \pm \frac{3}{16}x$

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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 $x = -2$

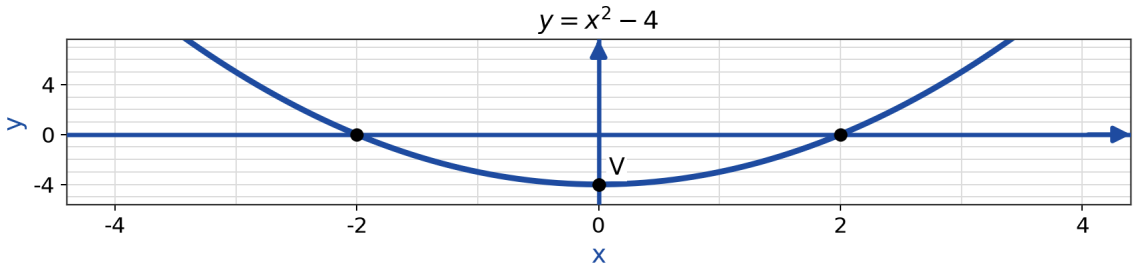
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15 **The conic $9x^2 + 9y^2 = 81$ is a**

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

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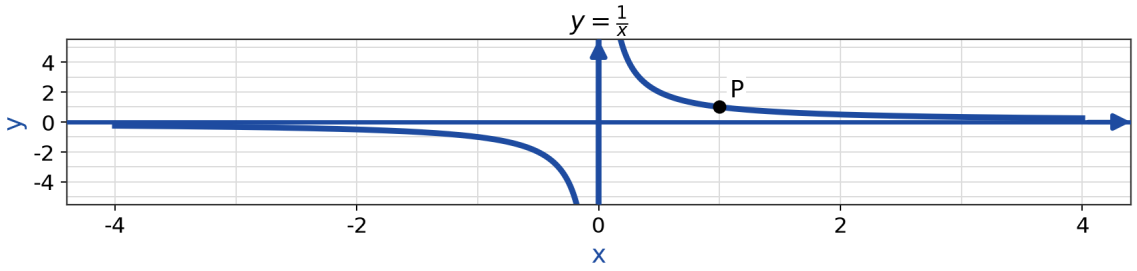
16 **The graph shows the parabola $y = x^2 - 4$. Its vertex, marked V, is**



- **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

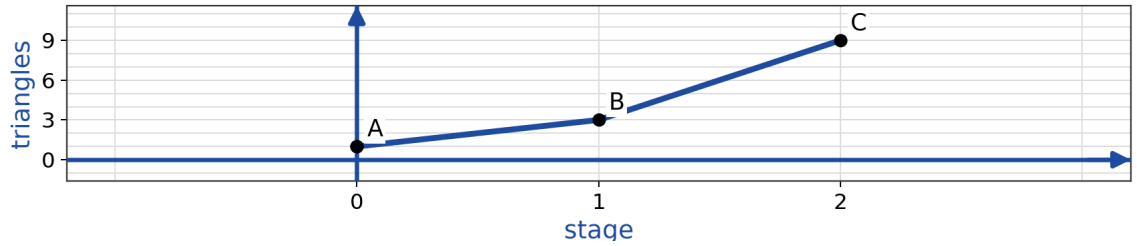
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24 The centre of the hyperbola $\frac{(x - 1)^2}{4} - \frac{(y + 2)^2}{9} = 1$ is

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

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