ONTARIO PRINCIPLES OF MATHEMATICS, GRADE 10, ACADEMIC (MPM2D) · FINAL EXAM · 50 QUESTIONS

Final Exam — 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 $y = -2(x - 1)^2 + 5$ is**

- A (-1, 5)
- B (1, -5)
- C (-1, -5)
- D (1, 5)

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2 **Solve the system $y = -x + 1$, $3x + 2y = 4$. The solution is**

- A (-2, -1)
- B (2, -1)
- C (2, 1)
- D (-1, 2)

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3 **For the segment joining (0, 0) and (3, 6), the slope of the segment is**

ANSWER _____

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4 **Triangle ABC is shown. Side AB has length 6 and side AC has length 8. It is similar to a larger triangle. The side in the larger triangle that corresponds to side AB has length 18. The length of the side in the larger triangle that corresponds to side AC is**

ANSWER _____

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5 **The parabola $y = 2x^2$ opens upward or downward, and has a maximum or a minimum value? The parabola opens**

A upward and has a minimum

B upward and has a maximum

C downward and has a minimum

D downward and has a maximum

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6 **Solve the system 2x + 3y = 11, 5x + y = 21. The solution is**

- A (4, 1)
- B (-4, 1)
- C (4, -1)
- D (1, 4)

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7 **For the segment joining (0, 0) and (6, 0), the equation of its perpendicular bisector is**

- A x = 6
- B y = 3
- C x = 3
- D y = 6

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8 **A pole 3 metres tall casts a shadow 4 metres long. At the same time, a tree casts a shadow 20 metres long. The height, in metres, of the tree is**

ANSWER

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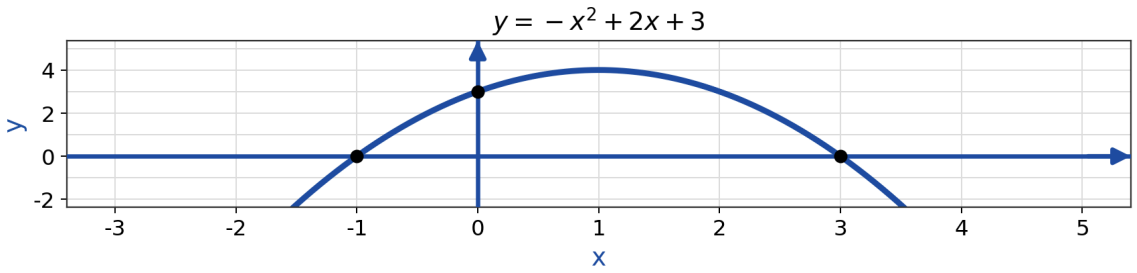
9 **The graph shows a parabola. The zeros of the relation are**



A x = 1, x = 3

B x = -1, x = -3

C x = -1, x = 3

D x = 1, x = -3

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10 **Solve the system -x + 5y = 13, 7x - 2y = 8. The solution is**

- A (-2, 3)
- B (2, -3)
- C (3, 2)
- D (2, 3)

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11 **The equation of the circle centred at (0, 0) with radius 5 is**

- A $x^2 + y^2 = 25$
- B $x^2 + y^2 = 5$
- C $x^2 + y^2 = 10$
- D $x^2 + y^2 = 26$

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12 **A right triangle has legs of length 3 and 4. The length of the hypotenuse is**

ANSWER _____

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13 **The zeros of the quadratic relation $y = x^2 + 3x - 10$ are**

A $x = -2, x = -5$

B $x = 2, x = 5$

C $x = 2, x = -5$

D $x = -2, x = 5$

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14 **Solve the system $y = -3x + 10$, $x + 2y = 0$. The value of x in the solution is**

ANSWER _____

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15 **For the circle $x^2 + y^2 = 49$, the radius is**

ANSWER _____

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16 **A right triangle has hypotenuse of length 13 and one leg of length 5. The length of the other leg is**

ANSWER _____

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17 **The zeros of the quadratic relation $y = x^2 - x - 12$ are**

A $x = 3, x = 4$

B $x = -3, x = -4$

C $x = 3, x = -4$

D $x = -3, x = 4$

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18 **Solve the system y = x + 7, x + 3y = 5. The value of y in the solution is**

ANSWER _____

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19 **For the segment joining (1, 2) and (7, 5), the slope of the segment is**

ANSWER _____

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20 **In a right triangle, the side adjacent to angle A has length 1 and the hypotenuse has length 2. The measure of angle A, in degrees, is**

ANSWER _____

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21 **The quadratic equation $x^2 + 4x + 3 = 0$ has**

- A two distinct real roots
- B one real root
- C no real roots
- D two imaginary roots

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22 **A theatre sells adult tickets for 10 dollars and child tickets for 6 dollars. On one night, 35 tickets were sold for a total of 290 dollars. The number of adult tickets sold was**

ANSWER _____

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23 **A triangle with vertices (0, 0), (2, 0) and (1, 1) is**

- A a right scalene triangle
- B an isosceles triangle that is not right
- C a right isosceles triangle
- D an equilateral triangle

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24 **In a right triangle, the hypotenuse has length 16 and one acute angle measures 60 degrees. The length of the side adjacent to the 60 degree angle is**

ANSWER _____

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25 **A ball is thrown upward. Its height, in metres, after t seconds is $h(t) = -5t^2 + 30t$. The time, in seconds, when the ball reaches its maximum height is**

ANSWER _____

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26 A shop sells pens for 5 dollars and pencils for 3 dollars. Sara buys 28 items for 116 dollars in total. The number of pens Sara buys is

ANSWER _____

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27 For the segment joining (-1, 5) and (5, 1), the y-coordinate of the midpoint is

ANSWER _____

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28 In a right triangle, one acute angle measures 60 degrees and the side adjacent to it has length 4. The length of the side opposite the 60 degree angle is

A 4

B $4\sqrt{3}$

C $4/\sqrt{3}$

D 8

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29 **The quadratic equation $x^2 + 6x + 9 = 0$ has**

A two distinct real roots

B no real roots

C two imaginary roots

D one real root

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30 **The sum of two numbers is 73 and their difference is 21. The larger number is**

ANSWER _____

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31 For the segment joining (0, 0) and (2, 3), the length of the segment is

- A $\sqrt{13}$
- B $\sqrt{12}$
- C $\sqrt{14}$
- D $\sqrt{16}$

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32 In a triangle, side a has length 8 opposite angle A of 30 degrees. Side b is opposite angle B of 90 degrees. The length of side b is

- A 8
- B 16
- C 32
- D 19

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33 **A shop sells notebooks. Revenue, in dollars, at price p dollars is $R(p) = -p^2 + 40p$. The maximum revenue, in dollars, is**

ANSWER _____

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34 **Plan A costs 36 dollars plus 4 dollars per hour. Plan B costs 10 dollars per hour. For how many hours do the two plans cost the same amount?**

ANSWER _____

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35 **For the segment joining (0, 0) and (1, 3), the length of the segment is**

A $\sqrt{9}$

B $\sqrt{10}$

C $\sqrt{11}$

D $\sqrt{13}$

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36 **In triangle ABC shown, side CA has length 5 and side CB has length 8, with an included angle of 60 degrees at C. The length of side AB is**

ANSWER _____

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37 **The larger solution of the equation $x^2 + 4x - 32 = 0$ is**

ANSWER _____

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38 **Solve the system $y = 3x + 1$, $y = -x + 4$. The system has**

A no solution

B one solution

C infinitely many solutions

D two solutions

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39 **The slope of a line perpendicular to a line of slope 2 is**

ANSWER _____

Understand It with Pulse | Flag a mistake

40 **In a triangle, two sides have lengths 5 and 12 with an included angle of 90 degrees. The length of the side opposite the included angle is**

ANSWER _____

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41 **A parabola has vertex (-2, 5) and equation $y = -(x + 2)^2 + 5$. Its y-intercept is**

ANSWER _____

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42 **The sum of the ages of two sisters is 36 years. The older sister is 2 times as old as the younger sister. The age, in years, of the younger sister is**

ANSWER _____

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43 **The slope of a line parallel to a line of slope 3 is**

ANSWER _____

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44 **A ladder 10 metres long leans against a wall, making an angle of 30 degrees with the ground. The height, in metres, reached by the top of the ladder is**

A 10

B 8

C 3

D 5

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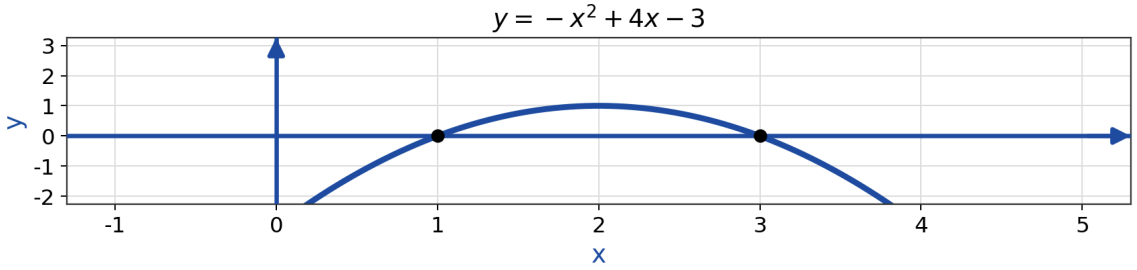
45 **The graph shows a parabola. The maximum value of the relation is**



ANSWER

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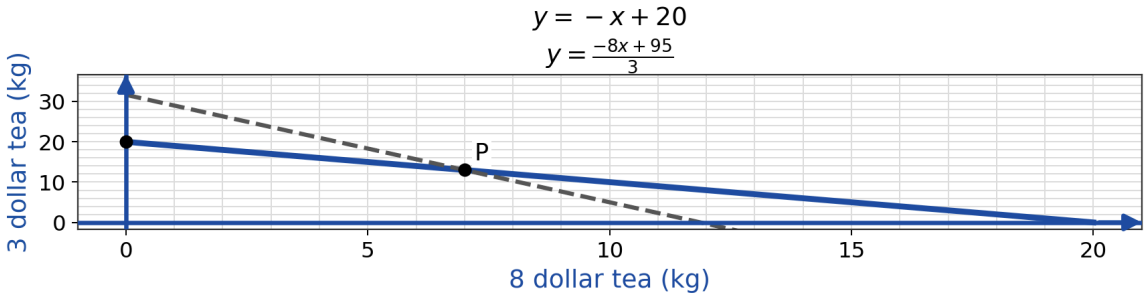
46 **The graph shows two lines for a tea mixture. A grocer mixes tea at 8 dollars per kilogram and tea at 3 dollars per kilogram. He makes 20 kilograms of mixture worth 95 dollars in total. The lines intersect at P. The mass, in kilograms, of the 8 dollar tea in the mixture is**



ANSWER

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47 **The most specific name for the quadrilateral with vertices (0, 0), (5, 0), (7, 3) and (2, 3) is**

- **A** a rectangle
- **B** a parallelogram
- **C** a square
- **D** a kite

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48 **A tree is 12 metres tall. An observer stands 12 metres from the tree. The angle of elevation to the top of the tree, in degrees, is**

ANSWER _____

Understand It with Pulse | Flag a mistake

49 **For any quadratic relation, the second differences of y-values for equally spaced x-values are**

A zero

B increasing

C constant

D decreasing

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50 **The sum of the ages of two sisters is 50 years. The older sister is 4 times as old as the younger sister. The age, in years, of the younger sister is**

ANSWER _____

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ANSWER KEY

1.	D	**18.**	3	**35.**	B
2.	B	**19.**	0.5	**36.**	7
3.	2	**20.**	60	**37.**	4
4.	24	**21.**	A	**38.**	B
5.	A	**22.**	20	**39.**	-0.5
6.	A	**23.**	C	**40.**	13
7.	C	**24.**	8	**41.**	1
8.	15	**25.**	3	**42.**	12
9.	C	**26.**	16	**43.**	3
10.	D	**27.**	3	**44.**	D
11.	A	**28.**	B	**45.**	1
12.	5	**29.**	D	**46.**	7
13.	C	**30.**	47	**47.**	B
14.	4	**31.**	A	**48.**	45
15.	7	**32.**	B	**49.**	C
16.	12	**33.**	400	**50.**	10
17.	D	**34.**	6		

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