

Brett Robbins Academic Consulting

Mathematics 20-1 Practice Test

Unit 3: Quadratics

25 Questions

Original practice questions written to the Alberta curriculum, in the style of past diploma examinations. Work through each question, then check your answers with the key at the end.

This practice test was made by AI and there may be mistakes. If a question or answer looks wrong, contact Brett for clarification.

Question 1

The vertex of the graph of $y = 3(x - 4)^2 + 2$ is

A) $(4, -2)$

B) $(-4, 2)$

C) $(4, 2)$

D) $(-4, -2)$

Question 2

The y-intercept of the graph of $y = x^2 - 5x + 6$ is

A) -6

B) 6

C) 5

D) 11

Question 3

The quadratic equation with roots 3 and -2 is

A) $x^2 - x - 6 = 0$

B) $x^2 + x - 6 = 0$

C) $x^2 - 5x + 6 = 0$

D) $x^2 + 5x + 6 = 0$

Question 4

The larger root of the equation $x^2 - 7x + 12 = 0$ is

Question 5

Compared to the graph of $y = x^2$, the graph of $y = (x + 2)^2 - 7$ is translated

A) 2 units right and 7 units down

B) 2 units left and 7 units up

C) 2 units right and 7 units up

D) 2 units left and 7 units down

Question 6

The solutions to the equation $x^2 - 9 = 0$ are

A) $x = \pm 3$

B) $x = 3$

C) $x = \pm 9$

D) $x = -3$

Question 7

The number of distinct real roots of the equation $2x^2 + 4x + 5 = 0$ is

A) 2

B) 1

C) 0

D) Infinitely many

Question 8

The x -coordinate of the vertex of the graph of $f(x) = 2x^2 - 12x + 7$ is

Question 9

When completing the square on the expression $x^2 + 6x$, the constant that must be added is

A) 36

B) 9

C) 3

D) 6

Question 10

The maximum value of the function $y = -x^2 + 4x + 1$ is

A) 1

B) 2

C) 6

D) 5

Question 11

The larger root of the equation $2x^2 - 3x - 2 = 0$ is

Question 12

Expressed in vertex form, $y = x^2 - 8x + 5$ is

A) $y = (x - 4)^2 + 21$

B) $y = (x - 4)^2 - 11$

C) $y = (x + 4)^2 - 11$

D) $y = (x - 4)^2 - 21$

Question 13

The domain and range of the function $f(x) = -2(x - 1)^2 + 8$ are

A) Domain : all real numbers

Range : $y \leq 8$

B) Domain : all real numbers

Range : $y \geq 8$

C) Domain : $x \leq 1$

Range : $y \leq 8$

D) Domain : all real numbers

Range : all real numbers

Question 14

The sum of the roots of the equation $3x^2 + 6x - 9 = 0$ is

Question 15

The height, in metres, of a ball t seconds after it is thrown is given by $h(t) = -5t^2 + 20t + 15$.

The maximum height reached by the ball is

- A) 15 m
- B) 20 m
- C) 35 m
- D) 40 m

Question 16

One factor of $2x^2 + 7x + 3$ is

- A) $(x + 3)$
- B) $(2x + 3)$
- C) $(x + 1)$
- D) $(2x + 1)$

Question 17

The vertex of the graph of $f(x) = x^2 + 2x - 8$ is

- A) $(-1, -9)$
- B) $(1, -9)$
- C) $(-1, 9)$
- D) $(-2, -8)$

Question 18

The product of the roots of the equation $x^2 - 4x - 21 = 0$ is

Question 19

A farmer uses 60 m of fencing to enclose a rectangular pen against a straight wall, so only three sides need fencing. The maximum area of the pen, in m^2 , is

- A) 400
- B) 450
- C) 600
- D) 900

Question 20

A parabola has vertex $(-2, 3)$ and passes through the point $(0, 11)$. Its equation is

A) $y = (x + 2)^2 + 3$

B) $y = -2(x + 2)^2 + 3$

C) $y = 2(x + 2)^2 + 3$

D) $y = 2(x - 2)^2 + 3$

Question 21

The equation $3x^2 + kx + 12 = 0$ has exactly one real root.

The positive value of k is

Question 22

The exact solutions to the equation $x^2 - 4x + 1 = 0$ are

A) $x = 2 \pm \sqrt{5}$

B) $x = 4 \pm \sqrt{3}$

C) $x = -2 \pm \sqrt{3}$

D) $x = 2 \pm \sqrt{3}$

Question 23

The graph of $y = ax^2 + bx + c$ has x -intercepts at -1 and 5 and a y -intercept of -10 .

The value of a is

A) 2

B) -2

C) $\frac{1}{2}$

D) $-\frac{1}{2}$

Question 24

The height, in metres, of a ball t seconds after it is kicked is given by $h(t) = -5t^2 + 25t + 30$.

The number of seconds until the ball hits the ground is

Question 25

Expressed in vertex form, $y = 2x^2 + 8x + 3$ is

A) $y = 2(x + 2)^2 + 3$

B) $y = 2(x - 2)^2 - 5$

C) $y = 2(x + 2)^2 - 5$

D) $y = (x + 2)^2 - 5$

Answer Key

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

This practice test was made by AI and there may be mistakes. If a question or answer looks wrong, contact Brett for clarification.