

Module 2 Practice Test

Part I: Double Matching

Match each standard form equation with its equivalent vertex form equation in column A and its factored form equation from column B.

Column A	Column B	Standard Form (Question)	Vertex Form (Column A)	Factored Form (Column B)
<u>C</u>	<u>B</u>	1. $y = x^2 - 2x - 15$ <small>$(x-5)(x+3)$</small>	a. $(x-7)^2 - 25$	a. $y = (x-17)(x-3)$
<u>A</u>	<u>D</u>	2. $y = x^2 - 14x + 24$ <small>$(x-12)(x-2)$</small>	b. $(x-10)^2 - 49$	b. $y = (x-5)(x+3)$
<u>D</u>	<u>C</u>	3. $y = x^2 + 14x - 32$ <small>$(x+16)(x-2)$</small>	c. $(x-1)^2 - 16$	c. $y = (x+16)(x-2)$
<u>B</u>	<u>A</u>	4. $y = x^2 - 20x + 51$ <small>$(x-17)(x-3)$</small>	d. $(x+7)^2 - 81$	d. $y = (x-12)(x-2)$

Part II: Multiple Choice

5. Which of the following is the correct factorization of the expression

$$3x^2 + 23x - 8?$$

- a. $(3x+1)(x-8)$ b. $(3x-8)(x+1)$ **c. $(3x-1)(x+8)$** d. $(3x-1)(x-8)$

6. Which of the following expressions is NOT equivalent to the expression

$$2(4x-3)(x-4)$$

- a. $(4x-3)(2x-8)$ b. $(8x-6)(x-4)$
c. $(2x-1)(4x-6)$ d. $8x^2 - 38x + 24$

7. Where is the vertex of the equation $y = x^2 + 24x + 29$

- a. $(-12, -115)$** b. $(12, -173)$ c. $(-12, -173)$ d. $(12, -115)$

* start by completing the square

$$x^2 + 24x = -29$$

$$x^2 + 24x + 144 = -29 + 144$$

$$x^2 + 24x + 144 = 115$$

$$(x+12)^2 = 115$$

$$-115 \quad -115$$

$$(x+12)^2 - 115 = 0$$

Part III: Short answer

Given some information, provide the other requested information

8. $y = (x-9)(x+3)$

a. The standard form equation:

$$y = x^2 - 6x - 27$$

b. The vertex:

$$x = \frac{-b}{2a} = \frac{6}{2} = 3 \quad y = 3^2 - 6(3) - 27 \quad \text{vertex} \quad (3, -36)$$

c. The y-intercept:

$$(0, -27)$$

9. $y = (x-4)^2 - 6$

a. What form is the equation above written in?

vertex form

b. The x-intercepts: (finish completing the square)

$$(x-4)^2 = 6$$

$$\sqrt{(x-4)^2} = \pm\sqrt{6}$$

$$x-4 = \pm\sqrt{6} \quad x = 4 \pm \sqrt{6}$$

c. The factored form equation:

$$y = (x-4)^2 - 6$$

$$(x-4)(x-4) - 6$$

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10. A quadratic equation that has x-intercepts of (-6, 0) and (3, 0), a stretch of 2, and the vertex is a minimum

a. Factored form equation:

$$y = -2(x+6)(x-3)$$

b. Vertex form equation:

$$y = -2(x^2 - 6x + 9) + 18 = -2x^2 + 12x + 18$$

c. Standard form equation:

$$y = -2(x^2 + 3x + 3) \quad y = -2x^2 - 6x - 6$$

A piece of information might be very easy to find in one form of a quadratic equation, and difficult in another. Below, decide which form is the easiest one to use to find the indicated information, say where you'd find it by using an example, and justify your answer.

11. Vertex:

Vertex form

$$y = (x-h)^2 + k$$

Vertex (-h, k)

12. Axis of symmetry:

vertex form or factored form

$$y = (x-h)^2 + k$$

vertex $x = -h$

13. y-intercept:

standard form $y = ax^2 + bx + c$

c value is the y-intercept

14. x-intercepts:

factored form

$$y = (x+a)(x+b)$$

x-intercepts (-a, 0) (-b, 0)

Factor the following polynomials.

15) $y^2 - 6y + 8$

$$(y-2)(y-4)$$

16) $15 - 8y + y^2$

$$y^2 - 8y + 15$$

$$(y-5)(y-3)$$

17) $x^2 - 10x + 24$

$$(x-4)(x-6)$$

18) $2x^2 + 15x + 7$

$$x^2 + 15x + 14$$

$$(x+14)(x+1)$$

$$(x+7)(2x+1)$$

19) $3x^2 - 5x - 12$

$$x^2 - 5x - 36$$

$$(x-4)(x+9)$$

$$(3x-4)(x+3)$$

20) $9x^2 + 11x + 2$

$$x^2 + 11x + 18$$

$$(x+9)(x+2)$$

$$(x+1)(9x+2)$$

