**Cubic Equations and Graphs GREEN**

**1.** Which of the following equations are cubic? (Circle them ☺)

y = 6x² + 3x – 2 y = 2x³ - 5x + 1 y = 8x4 + 10x² - 7 y = 5x + 6

y = 12 – 11x³ y = 4x² + 2x + 9 y = x³ - 7x² + 8x – 18 y = x² - 16

**2.** Use the solutions of the following equations to match them to their corresponding graphs below.

y = (x + 3)(x – 1)(x – 4) y = (x – 2)(x + 1)(x + 3) y = 5x(x + 1)(2x – 1)

  

**3.** Expand the following expressions.

**a.** (x + 2)(x + 5)(x + 1) **b.** (x – 3)(x + 4)(x – 2)

(x + 2)(x + 5)(x + 1) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (x – 3)(x + 4)(x – 2) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**c.** x(x + 5)(x – 4) **d.** (x + 3)³

x(x + 5)(x – 4) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (x + 3)³ = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**4.** What equations do these graphs represent?

  

y = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ y = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ y = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**5.** How many solutions does each cubic equation have?

**a.** (x + 1)(x – 3)(x + 4) = 0 \_\_\_\_\_\_ **b.** (x + 3)³ = 0 \_\_\_\_\_\_

**c.** -x(x + 1)(x - 3) = 0 \_\_\_\_\_\_ **d.** x²(x + 4) = 0 \_\_\_\_\_\_

**e.** (x² + 2x + 5)(x - 2) = 0 \_\_\_\_\_\_ **f.** (10 - x)(x + 4)(x – 1) = 0 \_\_\_\_\_\_

**WWW: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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**Cubic Equations and Graphs AMBER**

Highest power = 3

**1.** Which of the following equations are cubic? (Circle them ☺)

y = 6x² + 3x – 2 y = 2x³ - 5x + 1 y = 8x4 + 10x² - 7 y = 5x + 6

y = 12 – 11x³ y = 4x² + 2x + 9 y = x³ - 7x² + 8x – 18 y = x² - 16

**2.** Use the solutions of the following equations to match them to their corresponding graphs below.

What are their solutions if they = 0?

y = (x + 3)(x – 1)(x – 4) y = (x – 2)(x + 1)(x + 3) y = 5x(x + 1)(2x – 1)

  

Start with one pair of brackets, then do the other!

**3.** Expand the following expressions.

**a.** (x + 2)(x + 5)(x + 1) **b.** (x – 3)(x + 4)(x – 2)

(x + 2)(x + 5)(x + 1) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (x – 3)(x + 4)(x – 2) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**c.** x(x + 5)(x – 4) **d.** (x + 3)³

x(x + 5)(x – 4) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (x + 3)³ = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Use the solutions to form the brackets

**4.** What equations do these graphs represent?

  

y = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ y = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ y = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**5.** How many solutions does each cubic equation have?

Are any solutions repeated?

**a.** (x + 1)(x – 3)(x + 4) = 0 \_\_\_\_\_\_ **b.** (x + 3)³ = 0 \_\_\_\_\_\_

**c.** -x(x + 1)(x - 3) = 0 \_\_\_\_\_\_ **d.** x²(x + 4) = 0 \_\_\_\_\_\_

**e.** (x² + 2x + 5)(x - 2) = 0 \_\_\_\_\_\_ **f.** (10 - x)(x + 4)(x – 1) = 0 \_\_\_\_\_\_

**WWW: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**EBI: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Cubic Equations and Graphs RED**

Highest power = 3

**1.** Which of the following equations are cubic? (Circle them ☺)

y = 6x² + 3x – 2 y = 2x³ - 5x + 1 y = 8x4 + 10x² - 7 y = 5x + 6

y = 12 – 11x³ y = 4x² + 2x + 9 y = x³ - 7x² + 8x – 18 y = x² - 16

**2.** Use the solutions of the following equations to match them to their corresponding graphs below.

What are their solutions if they = 0?

y = (x + 3)(x – 1)(x – 4) y = (x – 2)(x + 1)(x + 3) y = 5x(x + 1)(2x – 1)

x = -3, \_\_\_ or \_\_\_

  

Start with one pair of brackets, then do the other!

**3.** Expand the following expressions.

**a.** (x + 2)(x + 5)(x + 1) **b.** (x – 3)(x + 4)(x – 2)

 

 (x + 2)(x² + 6x + 5)



(x + 2)(x + 5)(x + 1) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (x – 3)(x + 4)(x – 2) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**c.** x(x + 5)(x – 4) **d.** (x + 3)³

x(x + 5)(x – 4) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (x + 3)³ = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Use the solutions to form the brackets

**4.** What equations do these graphs represent?

  

y = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ y = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ y = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**5.** How many solutions does each cubic equation have?

Are any solutions repeated?

**a.** (x + 1)(x – 3)(x + 4) = 0 \_\_\_\_\_\_ **b.** (x + 3)³ = 0 \_\_\_\_\_\_

**c.** -x(x + 1)(x - 3) = 0 \_\_\_\_\_\_ **d.** x²(x + 4) = 0 \_\_\_\_\_\_

**e.** (x² + 2x + 5)(x - 2) = 0 \_\_\_\_\_\_ **f.** (10 - x)(x + 4)(x – 1) = 0 \_\_\_\_\_\_

**WWW: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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