

Review of Parabolas - NOTES

Date _____

- 1) When an equation has an x^2 as its highest degree, that means its graph is a

PARABOLA.

- 2) These equations of parabolas are called QUADRATIC equations.

- 3) General Standard form: $y = ax^2 + bx + c$

- 4) The most important parts of a parabola are its VERTEX and its

X-INTERCEPT(S) which are also called its ZEROS

- 5) Its vertex has coordinates (x, y) , where:

$$x = \frac{-b}{2a}$$

AND

$$y = f(x) = f\left(\frac{-b}{2a}\right)$$

★ PLUG IN YOUR
X-VALUE INTO
THE ORIGINAL
EQUATION.

Identify the vertex of each.

6) $y = -3x^2 + 12x - 11$

$a: -3, b: 12, c: -11$

$$x: \frac{-b}{2a} = \frac{-12}{2(-3)} = \frac{-12}{-6} = \textcircled{2}$$

$$y: -3(2)^2 + 12(2) - 11 = -3(4) + 24 - 11 = \textcircled{1}$$

$$\boxed{(2, 1)}$$

8) $y = -19x^2 + 38x - 9$

$a: -19, b: 38, c: -9$

$$x: \frac{-b}{2a} = \frac{-38}{2(-19)} = \frac{-38}{-38} = \textcircled{1}$$

$$y: -19(1)^2 + 38(1) - 9 = \textcircled{10}$$

$$\boxed{(1, 10)}$$

7) $y = -18x^2 + 324x - 1457$

$a: -18, b: 324, c: -1457$

$$x: \frac{-b}{2a} = \frac{-324}{2(-18)} = \frac{-324}{-36} = \textcircled{9}$$

$$y: -18(9)^2 + 324(9) - 1457 = -18(81) + 2916 - 1457 = \textcircled{1}$$

$$\boxed{(9, 1)}$$

9) To find its x-intercepts, you can FACTOR OR USE THE QUADRATIC FORMULA

Factor each completely.

10) $v^2 + 8v + 12 = 0$ 6×2

$(v+6)(v+2) = 0$

$v = -6 \text{ AND } -2$

12) $b^2 + 4b - 32 = 0$ -4×8

$(b-4)(b+8) = 0$

$b = 4, b = -8$

GCF 14) $6x^2 + 30x = 0$

$6x(x+5) = 0$

$x = 0 \text{ AND } x = -5$

GCF 16) $2v^2 - 7v = 0$

$v(2v-7) = 0$

$v = 0 \text{ OR } v = \frac{7}{2}$

18) $3n^2 - 17n - 56 = 0$ $(+) -17$ $(*) -168$

$(3n^2 + -24n) + (7n + -56)$ -24×7

$3n(n-8) + 7(n-8)$

$(3n+7)(n-8) \rightarrow n = -\frac{7}{3} + 8$

Identify the x-intercepts of each.

20) $y = -19x^2 - 57x + 190$

$x = \frac{-(-57) \pm \sqrt{(-57)^2 - (4 \cdot -19 \cdot 190)}}{2(-19)}$

$x = \frac{57 \pm \sqrt{17689}}{-38}$

$x = \frac{57 \pm 133}{-38}$

$x = 2 \text{ OR } -5$

11) $r^2 - 2r - 8 = 0$ 2×-4

$(r+2)(r-4) = 0$

$r = -2, 4$

13) $b^2 - 6b + 8 = 0$ -2×-4

$(b-2)(b-4) = 0$

$b = 2 \text{ OR } 4$

15) $2r^2 - 14r - 60 = 0$

GCF $2(r^2 - 7r - 30)$

$2(r+3)(r-10)$

$r = -3 \text{ OR } 10$

17) $7x^2 + 78x + 80 = 0$

$(7x^2 + 8x) + (70x + 80)$ $(+) 78$ $(*) 560$

$x(7x+8) + 10(7x+8)$ 84×70

$(x+10)(7x+8) = 0$

$x = -10, -\frac{8}{7}$

19) $5x^2 - 33x + 40 = 0$

$(5x^2 + -25x) + (-8x + 40)$ $(+) -33$ $(*) 200$

$5x(x-5) + -8(x-5)$ -25×-8

$(5x-8)(x-5) \rightarrow x = \frac{8}{5} \text{ OR } 5$

21) $y = -x^2 - 6x - 10$

$x = \frac{-(-6) \pm \sqrt{(-6)^2 - (4 \cdot -1 \cdot -10)}}{2(-1)}$

$x = \frac{6 \pm \sqrt{-4}}{-2} \rightarrow \text{NO SOLUTION}$

NO ZEROS