March 24 MCR3U Park Unit 3 test on Wed or Thur (April 1st or 2nd)

* solve $2x^2 - 12x - 14 = 0$

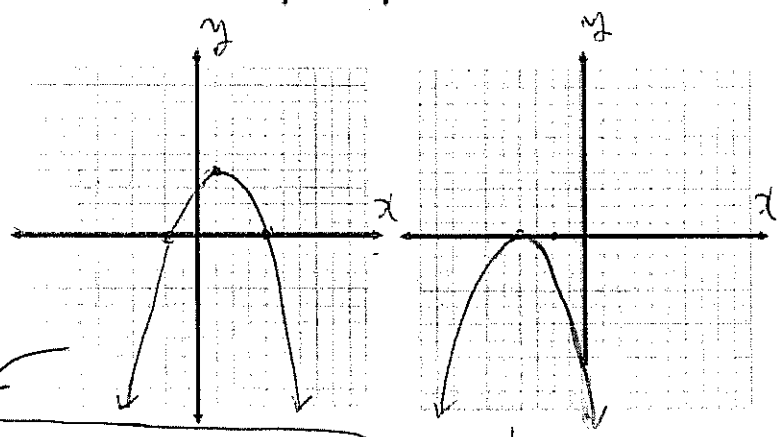
asking?

Find the x intercepts.

① Completing the square
② Graphing by Unit 2 skill.
③ Factoring
④ Using quadratic formula

Zeroes and the Discriminant

zeroes/x-intercepts: 3 possibilities



Two zeros or two solutions or two x intercepts

one zero or one solution or one x intercept

No solution or No zero or no x intercept

1) Factor each.

a) $7x^2 - 21x$

$= 7x(x - 3)$

$-21x \div -7x$

b) $x^2 + 8x + 12$

$= ax^2 + bx + c$

$= (x + 6)(x + 2)$

Hard Trinomial

Two integers: product $= ac$, sum $= b$

$6 \times 2 = 12 = ac$

$6 + 2 = 8 = b$

c) $x^2 - 36$

$a = x$, $b = 6$

Difference of Square $a^2 - b^2$

$= (x + 6)(x - 6)$

d) $x^2 - 3x - 40$

Hard Trinomial

$-8 \times 5 = -40 = ac$

$-8 + 5 = -3 = b$

$= (x - 8)(x + 5)$

e) $2x^2 + 7x + 3$

$= 2x^2 + 6x + x + 3$

$= 2x(x+3) + (x+3)$

$= (x+3)(2x+1)$

Two integers
ac = product → 6
b = sum → 7
$6 \times 1 = 6$
$6 + 1 = 7$

f) $3x^2 + 7x - 20$

$= 3x^2 + 12x - 5x - 20$

$= 3x(x+4) - 5(x+4)$

$= (x+4)(3x-5)$

$ac = 3 \times -20 = -60$
$b = 7$
$12 - 5 = 7$
$12 \times -5 = -60$

2) Find the zeroes of each parabola. zeros = x intercepts → sub $y = 0$

a) $f(x) = x^2 + 6x$

$0 = x^2 + 6x$

$0 = x(x+6)$

$\therefore x = 0$ or -6

b) $f(x) = x^2 + 7x + 12$

$0 = x^2 + 7x + 12$

$0 = (x+4)(x+3)$

$\therefore x = -4, -3$

$ac = 12$
$b = 7$
$4 \times 3 = 12$
$4 + 3 = 7$

c) $f(x) = x^2 - 8x$

$0 = x^2 - 8x$

$0 = x(x-8)$

$\therefore x = 0, 8$

d) $f(x) = 3x^2 + 12x$

$0 = 3x^2 + 12x$

$0 = 3x(x+4)$

$\therefore x = 0, -4$

e) $f(x) = x^2 - 9$

Diff of square $a^2 - b^2 = (a+b)(a-b)$

$0 = (x+3)(x-3)$

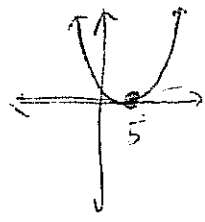
$\therefore x = 3, -3$

f) $f(x) = x^2 - 10x + 25$

$0 = x^2 - 10x + 25$

$0 = (x-5)^2$

$\therefore x = 5$



g) $f(x) = 2x^2 - 9x - 5$

$0 = 2x^2 - 9x - 5$

$0 = 2x^2 - 10x + x - 5$

$0 = 2x(x-5) + (x-5)$

$0 = (x-5)(2x+1)$

$\therefore x = 5, -\frac{1}{2}$

$ac = 2 \times -5 = -10$

$b = -9$

$-10 \times 1 = -10$

$-10 + 1 = -9$

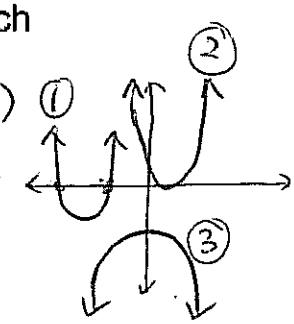
3) Without actually finding the zeroes, find out how many zeroes each parabola will have.

Standard form: $ax^2 + bx + c = 0$ (must be in standard form)

① If $b^2 - 4ac > 0$ → then there are two solutions

② If $b^2 - 4ac = 0$ → one solution

③ If $b^2 - 4ac < 0$ → No Solution



* Note: $b^2 - 4ac$ = Discriminant

a) $f(x) = x^2 + 6x$

$b^2 - 4ac = 6^2 - (4 \times 1 \times 0)$

$= 36 - 0 = 36$

$36 > 0 \Rightarrow b^2 - 4ac > 0$

$\therefore$ Two solutions

b) $f(x) = x^2 - 10x + 25$

$b^2 - 4ac = (-10)^2 - (4 \times 1 \times 25)$

$= 100 - 100 = 0$

$b^2 - 4ac = 0$

$\therefore$ This parabola has one solution.

c) $f(x) = x^2 - 6x + 11$

$b^2 - 4ac = (-6)^2 - (4 \times 1 \times 11)$

$= 36 - 44 = -8$

$b^2 - 4ac < 0$

$\therefore$ There is no solution.

Hwk. pg. 2 # ~~6 – 8~~ #7

pg. 49 # 6, 8

~~Worksheet (aceg for all)~~