4.2 Part3 Factoring Quadratic Equations

Solve (find the solutions or zeros) the following quadratic equations by ***FACTORING*** (if possible).

$0.2x^2 - 2.2x + 5.6 = 0$ Divide GCF

$0.2(x^2-11x+28)=0$ leading coefficient divides into all terms.

$0.2(x-7)(x-4)=0$

$x-7=0$ $\quad x=7$

$x-4=0$ $\quad x=4$

or

$(0.2x^2 - 2.2x + 5.6 = 0)10$ Multiply First

$2x^2-22x+56=0$

$2(x^2-11x+28)=0$

$2(x-7)(x-4)=0$

$x=7$ $\quad x=4$

$2\left(0=\frac{1}{2}x^2+\frac{3}{2}x+8\right)$ get rid of denominator by LCM

$0=x^2+3x+16$

→ nothing multiplies to 16 & adds to 3,

no x-intercepts

$9x^2 - 0.25 = 0$

$(3x+.5)(3x-.5)=0$

$3x+.5=0$

$\frac{3x}{3} = \frac{-.5}{3} = \frac{-\frac{1}{2}}{3} \times \frac{1}{1}$

$x = \pm\frac{1}{6}$

Same answer

or

$4(9x^2-.25=0)$

$36x^2-1=0$

$(6x+1)(6x-1)=0$

$16\left(\frac{9}{16}x^2-4=0\right)$

$9x^2-64=0$

$(3x-8)(3x+8)=0$

$3x-8=0$

$\frac{3x}{3} = \frac{8}{3}$

$x = \pm\frac{8}{3}$

Word Problems

The path of a dog jumping off a dock can be determined by the equation: $h(d) = -\frac{3}{10}d^2 + \frac{11}{10}d + 2$

Where h is the height above the surface of the water and d is the horizontal distance the dog jumps, both in feet. Determine the horizontal distance of the jump.

y-int

$h(d) = -\frac{3}{10}d^2 + \frac{11}{10}d + 2$

$10(0 = -\frac{3}{10}d^2 + \frac{11}{10}d + 2)$

$0 = -3d^2 + 11d + 20$

$0 = (-3d^2 + 15d)(-4d + 20)$

$0 = -3d(d-5) - 4(d-5)$

$0 = (-3d - 4)(d - 5)$

$-3d - 4 = 0$

$-3d = 4$

$\frac{-3d}{-3} = \frac{4}{-3}$

inadmissible

$d - 5 = 0$

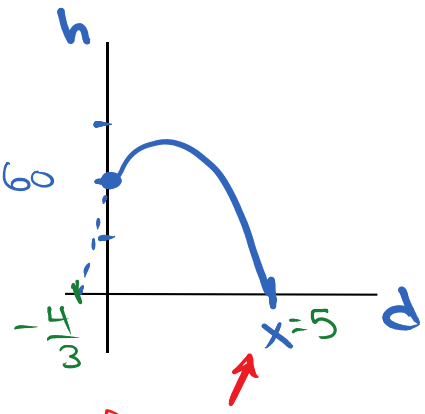
$d = 5$

The dog jumps 5 feet.

$- + - = +$

$- \times - = +$

rough graph



Find x-int!

let y = 0

The length of an outdoor lacrosse field is 10 m less than twice the width.

The area of the field is 6600 m^2.

Determine the dimensions of an outdoor lacrosse field (by factoring).

add 10

$l = 2w$

this is 10 less than

$l + 10 = 2w$

$-10 \quad -10$

$l = 2w - 10$

$A = lw$

$6600 = (2w - 10)(w)$

$6600 = 2w^2 - 10w$

$-6600 \quad -6600$

$0 = 2w^2 - 10w - 6600$

$0 = 2(w^2 - 5w - 3300)$

$0 = 2(w - 60)(w + 55)$

$w - 60 = 0$

$w = 60$ m

$w + 55$

inadmissible

$l = 2(60) - 10$

$= 120 - 10$

$l = 110$ m

Practice: p230 #8be, 9cd, 11, 13