

$$\cancel{8} \left(\frac{x^2}{\cancel{8}} + 10 \right) = 2^{(8)}$$

$$\textcircled{10} \quad x^2 + 3b = 7 - 10x$$

$$-7 + 10x$$

$$x^2 + 10x + 29 = 0$$

$$a=1$$

$$b=10$$

$$c=29$$

$$\frac{-10 \pm \sqrt{100 - 4(29)}}{2}$$

$$\frac{-10 \pm \sqrt{16}}{2}$$

$$\frac{-10 \pm 4i}{2} = \cancel{2} \frac{(-5 \pm 2i)}{\cancel{2}}$$

$$ax^2 + bx + c$$

20.9 Writing a Quadratic Equation

Given: $\{2, -5\}$ ---> Work backwards...

$$\sqrt{x=2} \quad \sqrt{x=-5}$$

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

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

$$x^2 + \underbrace{5x - 2x}_{3x} - 10 = 0$$

$$\boxed{x^2 + 3x - 10 = 0}$$

S $(x-2)(x+5)$

-3 $x=2 \quad x=-5$

-10

P

Write a quadratic equation whose roots are 3 and -7

Write a quadratic equation whose roots are $5i$ and $-5i$

Write a quadratic equation whose roots are $1/2$ and -2

$$2x = \frac{1}{2} \quad x = -2$$

$$2x = 1 \quad x = -2$$

$$(2x-1)=0 \quad (x+2)=0$$

The Sum and Product of the Roots:

$$\text{Sum of the roots} = \frac{-b}{a}$$

$$\text{Product of the roots} = \frac{c}{a}$$

Ex) For the quadratic equation $2x^2 + 5x + 8 = 0$, find:

a) sum of the roots

$$-\frac{5}{2}$$

b) product of the roots

$$\begin{aligned} a &= 2 \\ b &= 5 \\ c &= 8 \end{aligned}$$

$$\frac{8}{2} = 4$$

Write a quadratic equation whose roots are $3+\sqrt{5}$ and $3-\sqrt{5}$

$$(3+\sqrt{5})+(3-\sqrt{5})$$

$$\frac{-b}{a}$$

$$\text{sum} = \frac{b}{1} = -\frac{b}{a}$$

$$\begin{aligned} b &= -6 \\ a &= 1 \\ 4 &= c \end{aligned}$$

$$\frac{c}{a} = \text{prod} = 9 - 3\sqrt{5} + 3\sqrt{5} - \sqrt{25}$$
$$9 - 5 = 4$$

$$ax^2 + bx + c = 0$$

$$\boxed{1x^2 - 6x + 4 = 0}$$

If one root of a quadratic equation is $3+2i$, what is the other root?

Write a quadratic equation having these roots.

$$(3+2i) \quad (3-2i)$$

$$\text{sum} = 6 = \frac{-b}{a}$$

$$\text{prod} = 9 - 4i^2 \\ 9 + 4 = 13$$

$$b = -6 \\ a = 1$$

$$c = 13$$

$$x^2 - 6x + 13 = 0$$

If one root of $x^2 - 6x + k = 0$ is 4, find the other root.

$$16 - 24 + k = 0$$

$$-8 + k = 0$$

$$k = 8$$

$$x^2 - 6x + 8 = 0$$

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

$$x = 4 \quad | \quad x = 2$$

Write a quadratic equation whose roots are $6+i$ and $6-i$

$$x^2 - 12x + 37 = 0$$

Homework: pg 960

#5, 7, 8, 9, 19, 21, 24, 27, 29, 30, 32, 34, 39, 40, 44

Quiz tomorrow!