23) What is the difference between what the Quadratic Formula tells you vs what the Discriminant tells you?

THE DISCRIMINANT TELLS YOU HOW MANY X-INTERCEPTS THERE ARE.

THE QUADRATIC FORMULA TELLS YOU WHERE THE X-INTERCEPTS ARE.

Solve each equation with the quadratic formula.

24) $n^2 + 11n - 19 = 7$

$-7 \quad -7$

$n^2 + 11n - 26 = 0$ ✓

a: 1 b: 11 c: -26

$x = \frac{-11 \pm \sqrt{11^2 - (4 \cdot 1 \cdot -26)}}{2(1)}$

$x = \frac{-11 \pm \sqrt{121 - (-104)}}{2}$

$x = \frac{-11 \pm \sqrt{225}}{2}$

$x = \frac{-11 \pm 15}{2}$

$x = \frac{-11+15}{2}$ $\quad$ $x = \frac{-11-15}{2}$

$x = \frac{4}{2}$ $\quad$ $x = \frac{-26}{2}$

$x = 2$ $\quad$ $x = -13$

25) $2v^2 - 4v - 16 = 5$

$-5 \quad -5$

$2v^2 - 4v - 21 = 0$ ✓

a: 2 b: -4 c: -21

$x = \frac{-(-4) \pm \sqrt{(-4)^2 - (4 \cdot 2 \cdot -21)}}{2(2)}$

$x = \frac{4 \pm \sqrt{16 - (-168)}}{4}$

$x = \frac{4 \pm \sqrt{184}}{4}$

$x = \frac{4 \pm \sqrt{4 \cdot 46}}{4}$

$x = \frac{4 \pm 2\sqrt{46}}{4}$ ← THIS IS GOOD

$x = \frac{2 \pm 1\sqrt{46}}{2}$ ← THIS IS BETTER

26) $11a^2 + 8a = -11$

$+11 \quad +11$

$11a^2+8a+11=0$ ✓

$a:11 \quad b:8 \quad c:11$

$$x = \frac{-8 \pm \sqrt{8^2-(4\cdot 11\cdot 11)}}{2\cdot 11}$$

$$x = \frac{-8 \pm \sqrt{64-484}}{22}$$

$$x = \frac{-8 \pm \sqrt{-420}}{22}$$

$$x = \frac{-8 \pm \sqrt{-4\cdot 105}}{22}$$

$$x = \frac{-8 \pm 2i\sqrt{105}}{22}$$ ← THIS IS GOOD

$$x = \frac{-4 \pm i\sqrt{105}}{11}$$ ← THIS IS BETTER

Solve each equation by completing the square.

27) $b^2 - 18b + 85 = 8$

$-85 \quad -85$

$b^2-18b+\underline{\ ?\ } = -77+\underline{\ ?\ }$

$\left(\frac{b}{2}\right)^2 = \left(\frac{-18}{2}\right)^2 = (-9)^2 = 81$

$b^2-18b+81 = -77+81$

$(b-9)(b-9) = 4$

$(b-9)^2 = 4$

$b-9 = \pm\sqrt{4}$

$b-9 = \pm 2$

$b-9=2 \quad +9 \ +9$ → $b=11$

$b-9=-2 \quad +9 \ +9$ → $b=7$

28) $n^2 + 18n - 95 = -7$

$+95 \quad +95$

$n^2+18n+\underline{\quad} = 88+\underline{\quad}$

$\left(\frac{b}{2}\right)^2 = \left(\frac{18}{2}\right)^2 = 9^2 = 81$

$n^2+18n+81 = 88+81$

$(n+9)(n+9) = 169$

$(n+9)^2 = 169$

$n+9 = \pm\sqrt{169}$

$n+9 = \pm 13$

$n+9=13 \quad -9 \ -9$ → $n=4$

$n+9=-13 \quad -9 \ -9$ → $n=-22$

29) $x^2 + 20x + 13 = -4$

$-13 \quad -13$

$x^2 + 20x + \_\_\_\_ = -17 + \_\_\_\_$

$\left(\frac{b}{2}\right)^2 = \left(\frac{20}{2}\right)^2 = 10^2 = 100$

$x^2 + 20x + 100 = -17 + 100$

$(x+10)(x+10) = 83$

$(x+10)^2 = 83$

$x + 10 = \pm\sqrt{83}$

$x = \pm\sqrt{83} - 10$

30) $x^2 + 4x + 21 = 4$

$-21 \quad -21$

$x^2 + 4x + \_\_\_\_ = -17 + \_\_\_\_$

$\left(\frac{b}{2}\right)^2 = \left(\frac{4}{2}\right)^2 = 2^2 = 4$

$x^2 + 4x + 4 = -17 + 4$

$(x+2)(x+2) = -13$

$(x+2)^2 = -13$

$x + 2 = \pm\sqrt{-13}$

$x + 2 = \pm i\sqrt{13}$

$x = \pm i\sqrt{13} - 2$

31) What is the value of i?

$\sqrt{-1}$

32) What is the value of i^2?

-1

Simplify.

33) $-4 + 8i + 7 + 5i$

$3 + 13i$

34) $-8 + 7i - (-6 + 8i)$

$= -8 + 7i + 6 - 8i$

$= -2 - 1i$

35) $(-5 + 8i)(-7 - 6i)$

$= 35 + 30i - 56i - 48i^2$

$= 35 - 26i - 48(-1)$

$= 35 - 26i + 48$

$= 83 - 26i$

36) $(8 + 4i)^2 = (8+4i)(8+4i)$

$= 64 + 32i + 32i + 16i^2$

$= 64 + 64i + 16(-1)$

$= 64 + 64i - 16$

$= 48 + 64i$