Alg II: Ch. 1 Review

1. $\sqrt{-72}$

$6i\sqrt{2}$

72 = 2 · 36 = 6 · 6

2. $\sqrt{-99}$

$3i\sqrt{11}$

99 = 9 · 11 = 3 · 3 · 11

3. $(3+2i)-(4-6i)$

$(3+2i)+(-4+6i)$

$-1+8i$

4. $(2-i)(3+4i)$

$6+8i-3i-4i^2$

$6+5i-4(-1)$

$10+5i$

5. $(-4i+2)+(6-5i)$

$8-9i$

6. $\frac{(3-2i)}{(4+i)}\frac{(4-i)}{(4-i)} = \frac{12-3i-8i+2i^2}{16-4i+4i-i^2}$

$\frac{12-11i-2}{16-(-1)} = \frac{10-11i}{17}$

7. $x^2+19x+90$

$(x+9)(x+10)$

8. $3x^2-13x+12$

$(3x-4)(x-3)$

9. $15x^2-x-2$

$(5x-2)(3x+1)$

10. x^2-121

$(x+11)(x-11)$

11. $2x^2-162=0$

$\frac{2x^2}{2} = \frac{162}{2}$

$\sqrt{x^2} = \pm\sqrt{81}$

$x = \pm 9$

12. $x^2+1 = 3x^2-13$

$-x^2 \quad +13 \quad -x^2 \quad +13$

$\frac{14}{2} = \frac{2x^2}{2}$

$\pm\sqrt{7} = \sqrt{x^2}$

$x = \pm\sqrt{7}$

13. $\sqrt{(x+1)^2} = \pm\sqrt{7}$

$x+1 = \pm\sqrt{7}$

$x = -1 \pm \sqrt{7}$

14. $x^2+x-30=0$

$(x+6)(x-5)=0$

$x+6=0 \quad x-5=0$

$x=-6 \quad x=5$

15. $x^2 = 12x - 32$

$x^2 - 12x + 32 = 0$

$(x-4)(x-8) = 0$

$x-4=0 \quad x-8=0$

$x=4 \quad x=8$

16. $3x^2 + 5x = x^2 - 2x + 4$

$-x^2 \quad +2x \quad -4 \quad -x^2 \quad +2x \quad -4$

$2x^2 + 7x - 4 = 0$

$(2x-1)(x+4) = 0$

$2x-1=0 \quad x+4=0$

$x = \frac{1}{2} \quad x=-4$

17. $5x^2 - 20x + 20 = 0$

$a=5 \quad b=-20 \quad c=20$

$x = \frac{20 \pm \sqrt{(-20)^2 - 4(5)(20)}}{2(5)}$

$x = \frac{20 \pm \sqrt{0}}{10}$

$x = \frac{20}{10} = 2$

* 17+18 you can factor out GCF to make a, b, c smaller numbers

18. $2x^2 - 98 = 0$

$a=2 \quad b=0 \quad c=-98$

$x = \frac{0 \pm \sqrt{(0)^2 - 4(2)(-98)}}{2(2)}$

$x = \pm\frac{\sqrt{784}}{4} = \pm\frac{28}{4}$

$x = \pm 7$

19. $3x^2 - x = -5$

$3x^2 - x + 5 = 0$

$a=3 \quad b=-1 \quad c=5$

$x = \frac{1 \pm \sqrt{(-1)^2 - 4(3)(5)}}{2(3)}$

$x = \frac{1 \pm \sqrt{-59}}{6}$

$x = \frac{1 \pm i\sqrt{59}}{6}$

20. $x^2 - 4x + 12 = 0$

$x^2 - 4x \underline{\quad} = -12 \underline{\quad}$

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

$\sqrt{(x-2)^2} = \pm\sqrt{-8}$

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

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

21. $2x^2 - 4x - 4 = 0$

$2x^2 - 4x \underline{\quad} = 4 \underline{\quad}$

$2(x^2 - 2x \underline{\quad}) = 4 \underline{\quad}$

$(-2/2)^2 = (-1)^2$

$2(x-1)^2 = 6$

$\sqrt{(x-1)^2} = \pm\sqrt{3}$

$x = 1 \pm \sqrt{3}$

* you can factor out a 2 at the beginning to make it easier

22. $x^2 + 6x + 48 = 0$

$x^2 + 6x \underline{\quad} = -48 \underline{\quad}$

$\left(\frac{6}{2}\right)^2 = (3)^2$

$\sqrt{(x+3)^2} = \pm\sqrt{-39}$

$x + 3 = \pm i\sqrt{39}$

$x = -3 \pm i\sqrt{39}$