

2.46 p.133-134 (51-83) odd

$$(51) \frac{6}{i} \cdot \frac{i}{i} = \frac{6i}{i^2} = \frac{6i}{-1} = -6i$$

or

$$\frac{6}{i} \cdot \frac{(-i)}{(-i)} = \frac{-6i}{-i^2} = \frac{-6i}{-(-1)} = -6i$$

$$(53) \frac{2}{(4-5i)} \cdot \frac{(4+5i)}{(4+5i)} = \frac{8+10i}{16+20i-20i-25i^2} = \frac{8+10i}{16+25} = \frac{8+10i}{41} = \frac{8}{41} + \frac{10i}{41}$$

$$(55) \frac{2+i}{2-i} \cdot \frac{(2+i)}{(2+i)} = \frac{4+2i+2i+i^2}{4+2i-2i-i^2} = \frac{4+4i-1}{4+1} = \frac{3+4i}{5} = \frac{3}{5} + \frac{4i}{5}$$

$$(57) \frac{i}{(4-5i)^2} = \frac{i}{(4-5i)(4-5i)} = \frac{i}{16-20i-20i+25i^2} = \frac{i}{16-40i-25}$$

$$= \frac{i}{-9-40i} \cdot \frac{(-9+40i)}{(-9+40i)} = \frac{-9i+40i^2}{81-360i+360i-1600i^2}$$

$$= \frac{-9i+40(-1)}{81+1600} = \frac{-40-9i}{1681} = \frac{-40}{1681} - \frac{9}{1681}i$$

$$(59) \frac{2}{1+i} - \frac{3}{1-i}$$

$$\frac{2(1-i)}{(1+i)(1-i)} - \frac{3(1+i)}{(1+i)(1-i)} = \frac{2-2i-3-3i}{1-i^2-i^2} = \frac{-1-5i}{1-(-1)}$$

$$= \frac{-1-5i}{1+1} = \frac{-1-5i}{2} = -\frac{1}{2} - \frac{5}{2}i$$

$$(61) \sqrt{-18} - \sqrt{-54}$$

$$= \sqrt{9 \cdot 2 \cdot (-1)} - \sqrt{9 \cdot 6 \cdot (-1)}$$

$$3i\sqrt{2} - 3i\sqrt{6}$$

$$= 3i(\sqrt{2} - \sqrt{6}) \text{ or } 3(\sqrt{2} - \sqrt{6})i$$

$$(63) (-3 + \sqrt{-24}) + (7 - \sqrt{-44})$$

$$= -3 + 7 + \sqrt{4 \cdot 6 \cdot (-1)} - \sqrt{4 \cdot 11 \cdot (-1)}$$

$$= 4 + (2i\sqrt{6} - 2i\sqrt{11})$$

$$= 4 + 2(\sqrt{6} - \sqrt{11})i$$

$$(65) \sqrt{-6} \cdot \sqrt{-2}$$

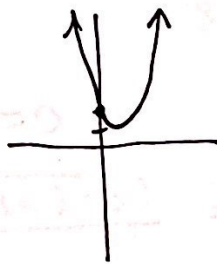
$$= i\sqrt{6} \cdot i\sqrt{2}$$

$$= i^2 \sqrt{12}$$

$$= -1 \sqrt{4 \cdot 3}$$

$$= -2\sqrt{3}$$

★ Take out i's first



$$(67) (\sqrt{-10})^2$$

$$= (i\sqrt{10})^2$$

$$= i^2 (\sqrt{10})^2$$

$$= -1 \cdot 10 = -10$$

$$(69) (2 - \sqrt{-6})^2$$

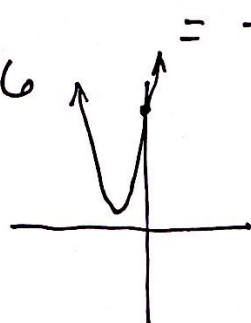
$$= (2 - i\sqrt{6})(2 - i\sqrt{6})$$

$$= 4 - 2i\sqrt{6} - 2i\sqrt{6} + i^2 \cdot 6$$

$$= 4 - 4i\sqrt{6} - 6$$

$$= -2 - 4i\sqrt{6}$$

$$= -2 - 4\sqrt{6}i$$



$$(71) x^2 + 25 = 0$$

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

$$x = \frac{-0 \pm \sqrt{0^2 - 4(1)(25)}}{2(1)}$$

$$= \frac{\pm \sqrt{-100}}{2} = \frac{\pm 10i}{2} = \pm 5i$$

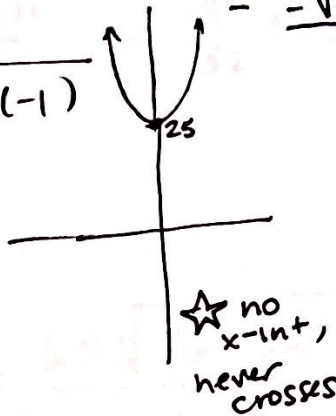
- or -

$$x^2 + 25 = 0$$

$$x^2 = -25$$

$$x = \pm \sqrt{-25}$$

$$= \pm 5i$$



$$(73) x^2 - 2x + 2 = 0$$

$$x = \frac{2 \pm \sqrt{(-2)^2 - 4(1)(2)}}{2(1)} = \frac{2 \pm \sqrt{4 - 8}}{2}$$

$$= \frac{2 \pm \sqrt{-4}}{2} = \frac{2 \pm 2i}{2} = 1 \pm i$$

$$(75) 4x^2 + 16x + 17 = 0$$

$$x = \frac{-16 \pm \sqrt{(16)^2 - 4(4)(17)}}{2(4)}$$

$$= \frac{-16 \pm \sqrt{256 - 272}}{8} = \frac{-16 \pm \sqrt{-16}}{8}$$

$$= \frac{-16 \pm 4i}{8} = \frac{-16}{8} \pm \frac{4i}{8}$$

$$= -2 \pm \frac{i}{2}$$

$$(77.) 16t^2 - 4t + 3 = 0$$

$$x = \frac{4 \pm \sqrt{(-4)^2 - 4(16)(3)}}{2(16)} = \frac{4 \pm \sqrt{16 - 192}}{32} = \frac{4 \pm \sqrt{-176}}{32}$$

$$= \frac{4 \pm \sqrt{16 \cdot 11 \cdot (-1)}}{32} = \frac{4 \pm 4i\sqrt{11}}{32} = \frac{4}{32} \pm \frac{4i\sqrt{11}}{32} = \frac{1}{8} \pm \frac{\sqrt{11}}{8}i$$

$$(79.) \frac{3}{2}x^2 - 6x + 9 = 0$$

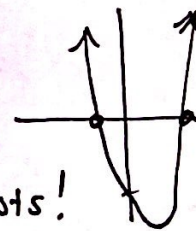
$$x = \frac{6 \pm \sqrt{(-6)^2 - 4(\frac{3}{2})(9)}}{2(\frac{3}{2})} = \frac{6 \pm \sqrt{36 - 54}}{3} = \frac{6 \pm \sqrt{-18}}{3}$$

$$= \frac{6 \pm \sqrt{9 \cdot 2 \cdot (-1)}}{3} = \frac{6 \pm 3i\sqrt{2}}{3} = \frac{6}{3} \pm \frac{3\sqrt{2}}{3}i = 2 \pm \sqrt{2}i$$

$$(81.) 1.4x^2 - 2x - 10 = 0$$

$$x = \frac{2 \pm \sqrt{(-2)^2 - 4(1.4)(-10)}}{2(1.4)} = \frac{2 \pm \sqrt{4 + 56}}{2.8} = \frac{2 \pm \sqrt{60}}{2.8} = \frac{2 \pm 2\sqrt{15}}{2.8}$$

$$2 \frac{4}{5} = \frac{2 \pm 2\sqrt{15}}{\frac{4}{5}} = \frac{5}{14} (2 \pm 2\sqrt{15}) = \frac{5}{7} \pm \frac{5\sqrt{15}}{7}$$



$$(83.) -6i^3 + i^2$$

$$= -6(i^2)i + (-1)$$

$$= -6(-1)i - 1$$

$$= 6i - 1$$

$$= -1 + 6i$$