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Chapter 2 – 2.V

① a) $x^2+7x+10=0$
$(x+2)(x+5)=0$
$x+2=0 \quad x+5=0$
$x=-2$ or $x=-5$

b) $x^2-5x-24=0$
$(x-8)(x+3)=0$
$x-8=0 \quad x+3=0$
$x=8$ or $x=-3$

c) $x^2+6x=0$
$x(x+6)=0$
$x=0$ or $x+6=0$
$x=0$ or $x=-6$

② a) $7x^2=21x \qquad 7x^2-21x=0$
$7x(x-3)=0$
$7x=0$ or $x-3=0$
$x=0$ or $x=3$

b) $4x^2=49 \qquad 4x^2-49=0$
$(2x-7)(2x+7)=0$
$2x-7=0$ or $2x+7=0$
$x=3.5$ or $x=-3.5$

c) $4x^2-20x+25=0$
$(2x-5)(2x-5)=0$
$2x-5=0$
$x=2.5$

d) $2x^2-5x+2=0$
$(2x-1)(x-2)=0$
$2x-1=0$ or $x-2=0$
$x=0.5$ or $x=2$

③ a) $(x-4)^2=0$
$x-4=0$
$x=4$

b) $x(2x-1)=21$
$2x^2-x-21=0$
$(2x-7)(x+3)=0$
$2x-7=0$ or $x+3=0$
$x=3.5$ or $x=-3$

c) $4x^2+14x+24=2x^2-10x$
$2x^2+14x+24=0$
$2(x^2+7x+12)=0$
$2(x+3)(x+4)=0$
$x+3=0 \quad x+4=0$
$x=-3$ or $x=-4$

④ a) $x^2+8x+6=0$
$b^2-4ac=64-24=40$
$x=\frac{-8\pm\sqrt{40}}{2}$
$x=-4\pm\sqrt{10}$

b) $x^2+4x=1$
$x^2+4x-1=0$
$b^2-4ac=16+4=20$
$x=\frac{-4\pm\sqrt{20}}{2}$
$x=-2\pm\sqrt{5}$

c) $2x^2-12x+15=0$
$b^2-4ac=144-120=24$
$\frac{-b\pm\sqrt{b^2-4ac}}{2a}=\frac{12\pm\sqrt{24}}{2(2)}$
$x=\frac{12\pm2\sqrt{6}}{4}=\frac{6\pm\sqrt{6}}{2}$

⑤ a) $10x-x^2-9=0$
$x^2-10x+9=0$
$(x-1)(x-9)=0$
$x=1$ or $x=9$

b) $64x^2=100$
$x^2=\frac{100}{64}=\frac{25}{16}$
$x=\pm\frac{5}{4}$

c) $3x^2+10x-25=0$
$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}=\frac{-10\pm\sqrt{100+300}}{6}$
$=\frac{-10\pm20}{6} \qquad x=\frac{10}{6}$
$x=\frac{5}{3}$ or $x=-5$

a) $2x=3x^2+5$
$3x^2-12x+5=0$
$x=\frac{12\pm\sqrt{144-60}}{6}=\frac{12\pm\sqrt{84}}{6}$
$x=3.53$ or $x=0.472$

e) $x=\pm\sqrt{5x} \qquad x^2=5x$
$x^2-5x=0$
$x(x-5)=0$
$x=0$ or $x=5$

f) $2x^2+6x+1=0$
$x=\frac{-6\pm\sqrt{36-8}}{4}=\frac{-6\pm\sqrt{28}}{4}$
$x=-0.177$ or $x=-2.82$

⑥ a) $20=(2x+3)(3x-5)$
$20=6x^2-10x+9x-15$
$20=6x^2-x-15$
$6x^2-x-15-20=0$
$6x^2-x-35=0$

b) $6x^2-x-35=0$
$(3x+7)(2x-5)=0$
$3x+7=0 \quad x=-7/3$
$2x-5=0 \quad x=5/2$
$2(5/2)+3=8$
$3(5/2)-5=2.5$
Length = 8m
Width = 2.5m

⑦ $x^2+4x+1=0$
$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$
$b^2-4ac=$
$4^2-4(1)(1)$
$=16-4=12$
$x=\frac{-4+\sqrt{12}}{2(1)}$
$=\frac{-4\pm2\sqrt{3}}{2}$
$=-2\pm\sqrt{3}$

⑧ $0.1x^2+1.6x=0.8$
$0.1x^2+1.6x-0.8=0$
$x^2+16x-8=0$
b^2-4ac
$16^2-4(1)(-8)$
$256+32=288$
$x=\frac{-16\pm\sqrt{288}}{2(1)}$
$=-8\pm6\sqrt{2}$
$x=0.485$
and
$x=-16.5$