Factoring / Completing the Square / Quadratic Formula.

Chapter 4 Review Part 1 7, 8, 9, 13, 15, 18, 19 pgs 258-260

7 a) $x^2+10x+21=0$
$(x+7)(x+3)=0$
$x=-7 \quad x=-3$

b) $\frac{1}{4}m^2+2m-5=0$
$m^2+8m-20=0$
$(m+10)(m-2)=0$
$m=-10 \quad m=2$

c) $5p^2+13p-6=0$
$(5p-2)(p+3)=0$
$p=2/5 \quad p=-3$

d) $6z^2-21z+9=0$
$2z^2-7z+3=0$
$(2z-1)(z-3)=0$
$z=1/2 \quad z=3$

8 a) $-4g^2+10g+6=0$
$2g^2-5g-3=0$
$(2g+1)(g-3)=0$
$g=-1/2 \quad g=3$

b) $8y^2-14y+5=0$
$(4y-5)(2y-1)=0$
$y=5/4 \quad y=1/2$

c) $-25k^2+30k-9=0$
$25k^2-30k+9=0$
$(5k-3)(5k-3)=0$
$k=3/5$

d) $2x^2-9x-18=0$
$(2x+3)(x-6)$
$x=-3/2 \quad x=6$

9 a) $x=2 \quad x=3$
$x-2=0 \quad x-3=0$
$(x-2)(x-3)=0$
$x^2-5x+6=0$

b) $x=-1 \quad x=-5$
$x+1=0 \quad x+5=0$
$(x+1)(x+5)=0$
$x^2+6x+5=0$

c) $x=3/2 \quad x=-4$
$x-\frac{3}{2}=0 \quad x+4=0$
$2x-3=0 \quad x+4=0$
$(2x-3)(x+4)=0$
$2x^2+5x-12=0$

Hi Jacy

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13 a) x^2+4x+K $K=4$

b) x^2+3x+K $3 \to 3/2 \to 9/4$ $K=9/4$

15 a) $-2x^2+16x=3$

$x^2-8x=-3/2$

$x^2-8x+16=-3/2+16$

$(x-4)^2=29/2$

$x-4=\pm\sqrt{29/2}$

$x=4\pm\sqrt{29/2}$

$x=-4\pm\frac{\sqrt{29}}{\sqrt{2}}$

$x=-\frac{8}{2}\pm\frac{\sqrt{58}}{2}$

$x=\frac{-8\pm\sqrt{58}}{2}$

b) $5y^2+20y=-1$

$y^2+4y=-1/5$

$y^2+4y+4=-1/5+4$

$(y+2)^2=19/5$

$y+2=\pm\sqrt{19/5}$

$y=-2\pm\sqrt{\frac{19}{5}}$

$y=-2\pm\frac{\sqrt{19}}{\sqrt{5}}$

$y=-2\pm\frac{\sqrt{95}}{5}$

$y=\frac{-10\pm\sqrt{95}}{5}$

c) $4p^2+2p=-5$

$p^2+\frac{1}{2}p=-5/4$

$p^2+\frac{1}{2}p+1/16=-\frac{5}{4}+\frac{1}{16}$

$(p+\frac{1}{4})^2=-\frac{19}{16}$ no solution

18 a) $2x^2+11x+5$ $b^2-4ac=11^2-4(2)(5)$ $b^2-4ac=81$

$\therefore$ 2 distinct real roots.

b) $4x^2-4x+1$ $b^2-4ac=16-4(4)(1)$

$b^2-4ac=0$ one real root

c) $3p^2+6p+24$ $b^2-4ac=36-4(3)(24)$

$b^2-4ac=-252$ no real roots

d) $4x^2+4x-7$ $b^2-4ac=16-4(4)(-7)$

$b^2-4ac=128$ two distinct real roots

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19. a) $-3x^2-2x+5=0$

$x = \frac{2 \pm \sqrt{4-4(-3)(5)}}{-6}$

$x = \frac{+2 \pm \sqrt{64}}{-6}$

$x = \frac{+2 \pm 8}{-6}$

$x = \frac{-6}{-6}, \frac{+10}{-6}$

$x = +1 \quad x = -5/3$

b) $5x^2+7x+1=0$

$x = \frac{-7 \pm \sqrt{49-4(5)(1)}}{10}$

$x = \frac{-7 \pm \sqrt{29}}{10}$

c) $0 = 3x^2-4x-1$

$x = \frac{4 \pm \sqrt{16-4(3)(-1)}}{6}$

$x = \frac{4 \pm \sqrt{28}}{6}$

$x = \frac{4 \pm 2\sqrt{7}}{6}$

$x = \frac{2 \pm \sqrt{7}}{3}$

d) $25x^2+90x+81=0$

$x = \frac{-90 \pm \sqrt{90^2-4(25)(81)}}{50}$

$x = \frac{-90}{50}$

$x = -9/5$

Chapter 4 Review Part 2 Applications

pg 260 20, 21
pg 262 10, 12, 13, 14
pg 265 10
pg 266 7
pg 267 11

pg 260 #20 a) $-2x^2+6x+1=0$

b) $-2x^2+6x=-1$

$x^2-3x=1/2$

$x^2-3x+9/4=1/2+9/4$

$(x-3/2)^2=11/4$

$x-3/2=\pm\sqrt{11/4}$

$x=3/2\pm\sqrt{11}/2$

$x=\frac{3\pm\sqrt{11}}{2}$ → $x=3.2$ $x=-0.2$ discard

3.2 m

#21 x = decrease of 0.05

a) fare $= 3.7-0.05x$

b) people $= 2480+40x$

c) $R=(3.7-0.05x)(2480+40x)$

$R=-2x^2+24x+9176$

d) $9246=-2x^2+24x+9176$

$0=-2x^2+24x-70$

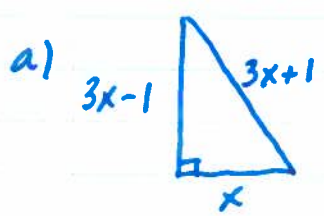
$0=x^2-12x+35$

$0=(x-7)(x-5)$

$x=7$ $x=5$ 5 or 7 decreases.

pg 262 #10 shorter leg $= x$

a)



b) $x^2+(3x-1)^2=(3x+1)^2$

c) $x^2+9x^2-6x+1=9x^2+6x+1$

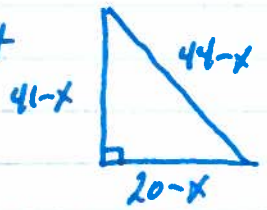
$x^2-12x=0$

$x(x-12)=0$

$x=0$ (discard) $x=12$

shorter leg 12 cm
longer leg 35 cm
hypotenuse 37 cm

pg 252 #12 x = amount cut



$(44-x)^2 = (41-x)^2 + (20-x)^2$

$x^2 - 88x + 1936 = x^2 - 82x + 1681 + x^2 - 40x + 400$

$-x^2 + 34x - 145 = 0$

$x^2 - 34x + 145 = 0$

$(x-5)(x-29) = 0$

$x = 5 \quad x = 29$

(can't cut 29 from 20)

$x = 5$ cm

#13

$2x + 2y = 100$

$x + y = 50$

$xy = 616$

$x(50-x) = 616$

$-x^2 + 50x - 616 = 0$

$x^2 - 50x + 616 = 0$

$(x-22)(x-28) = 0$

$x = 22 \quad x = 28$

$y = 28 \quad y = 22$

22 cm × 28 cm

L W − garden = garden

#14 a) $(2x+9)(2x+6) - 54 = 54$

$4x^2 + 30x - 54 = 0$

b) $2x^2 + 15x - 27 = 0$

$(2x-3)(x+9)$

$x = 3/2 \quad x = -9$

width of strip 1.5 m

c) length $1.5 + 9 + 1.5 = 12$

width $1.5 + 6 + 1.5 = 9$

$\therefore$ perimeter = 42 m

pg 265 #10 # of seats = seats per row × rows x = seats per row

$285 = x(x+4)$

$x^2 + 4x = 285$

$x^2 + 4x + 4 = 289$

$(x+2)^2 = 289$

$x + 2 = \pm 17$

$x = -2 \pm 17$ $x = 15, -19$ (discard)

15 seats per row

19 rows

pg 266 #7 Revenue = rent × units

$R = 200 \times 80$ x = $20 increase

$R = (200 + 20x)(80 - x)$

intercepts $x = -10$ $x = 80$

max at vertex $x = 35$

35 increases = $700 increase

∴ $900 per week

pg 267 #11 original square $x \cdot x$

new base $(x-4)(x-4)$

volume $2(x-4)(x-4) = 128$

$(x-4)(x-4) = 64$

$(x-4)^2 = 64$

$x - 4 = 8$

$x = 12$ 12 cm × 12 cm