FMPC 10
2.1, page 68
#5a,j

FMPC 10 2.1 page 68

5a) $3x^2 - 2x + 5x - x^2 = 3x^2 - x^2 - 2x + 5x = \boxed{2x^2 + 3x}$

like terms

FMPC 10 p.68 section 2.1

5j) $\sqrt{\frac{2}{3}}y - \frac{5\sqrt{6}}{3}y - y^3 - \frac{1}{4}y^2$

$= \frac{\sqrt{2}y}{\sqrt{3}} - \frac{5\sqrt{6}}{3}y - y^3 - \frac{1}{4}y^2$ common denominator for $\sqrt{3}$ and 3 is 3

$= \frac{\sqrt{2}y}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} - \frac{5\sqrt{6}}{3}y - y^3 - \frac{y^2}{4}$ think... $\frac{1}{4}y^2 = \frac{y^2}{4}$

$= \frac{\sqrt{6}y}{3} - \frac{5\sqrt{6}}{3}y - y^3 - \frac{y^2}{4}$ think... $\sqrt{2} \times \sqrt{3} = \sqrt{6}$

$\sqrt{3} \times \sqrt{3} = \sqrt{9} = 3$

$= \frac{-4\sqrt{6}y}{3} - y^3 - \frac{y^2}{4}$ think $1\sqrt{6} - 5\sqrt{6} = -4\sqrt{6}$

$= -y^3 - \frac{y^2}{4} - \frac{4\sqrt{6}y}{3}$

FMPC 10

2.1, page 68

#6g

6g) $-x^5 - 3x^3$ if $x = -2$ we get $-(-2)^5 - 3(-2)^3$

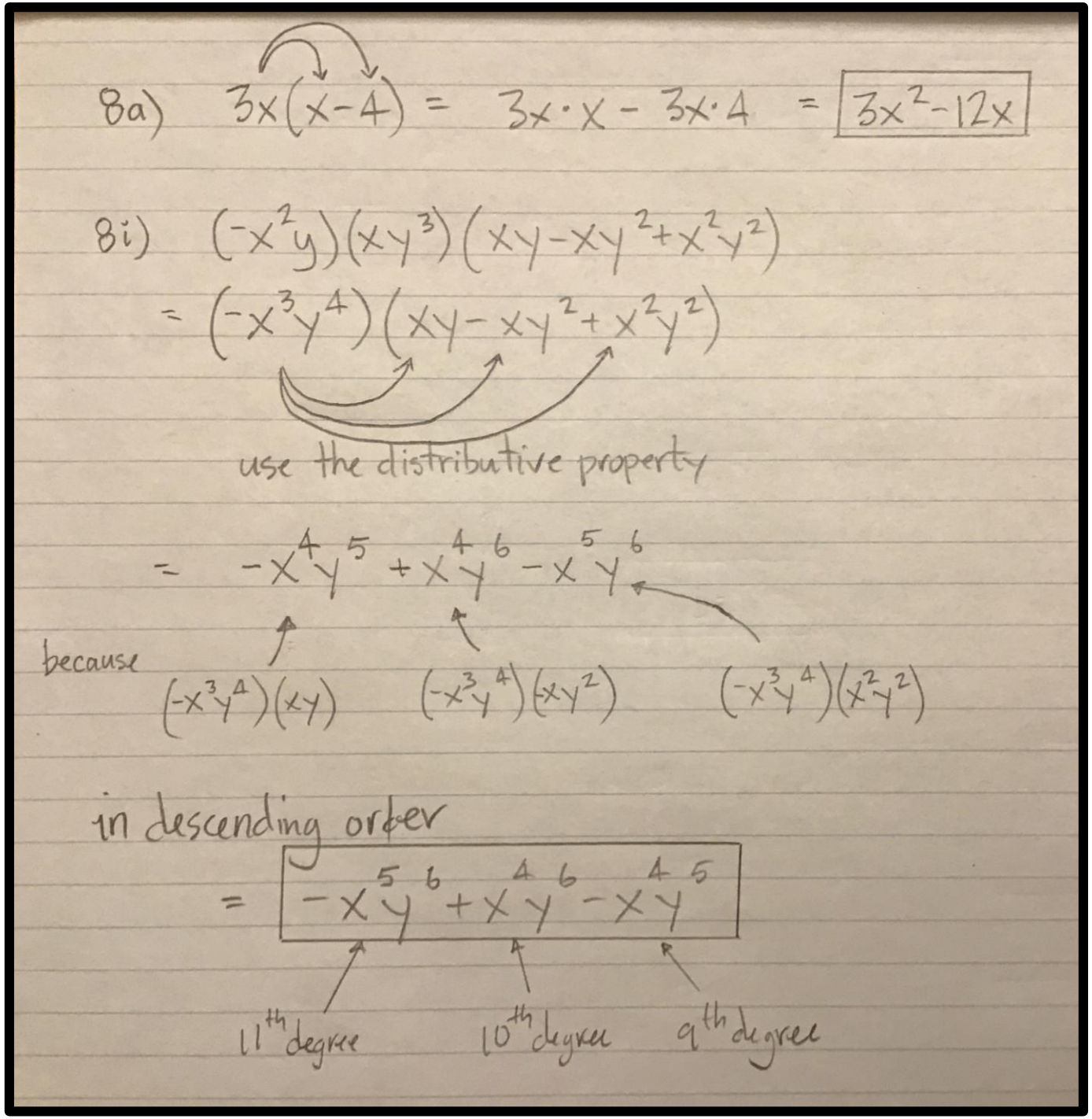
$= -(-32) - 3(-8)$

$= 32 + 24 = \boxed{56}$

FMPC 10

2.1, page 69

#8a,i



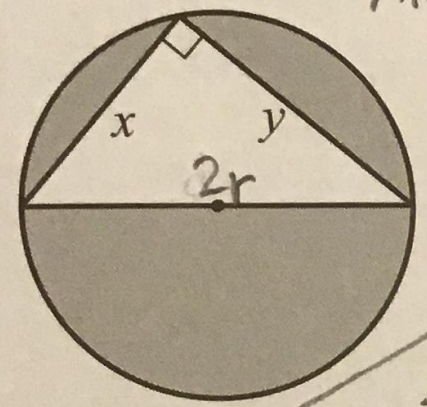
FMPC 10

2.1, page 70

#10a

10. Determine the area of the shaded region in terms of x, y and π.

a)



AREA OF SHADED REGION

= AREA OF CIRCLE − AREA OF TRIANGLE

$= \pi r^2 - \frac{1}{2} x \cdot y$

determine the radius

$= \frac{\pi (x^2+y^2)}{4} - \frac{xy}{2}$

$= \frac{\pi x^2 + \pi y^2}{4} - \frac{xy}{2}$

$= \frac{\pi x^2}{4} + \frac{\pi y^2}{4} - \frac{xy}{2}$

$x^2+y^2=(2r)^2$

$x^2+y^2=4r^2$

$\frac{x^2+y^2}{4}=r^2$

because $r^2=\frac{x^2+y^2}{4}$

FMPC 10

2.2, page 77

#2g,i

FMPC 10 2.2 page 77

2g) $(-2x^2-3y^2)^2 = (-2x^2-3y^2)(-2x^2-3y^2)$

F O I L

$= 4x^4+6x^2y^2+6x^2y^2+9y^4$

F O I L

collect the like terms $= \boxed{4x^4+12x^2y^2+9y^4}$

2i) $(-a^3b+c^2d^2)^2 = (-a^3b+c^2d^2)(-a^3b+c^2d^2)$

$= a^6b^2-a^3bc^2d^2-a^3bc^2d^2+c^4d^4$

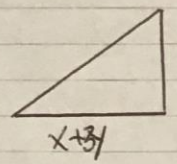
F O I L

$= \boxed{a^6b^2-2a^3bc^2d^2+c^4d^4}$

FMPC 10
2.2, page 78
#4a, #5a,b

FMPC 10 2.2 p.78-79

4a)



Area of a triangle = ½ base × height

$\therefore$ Area $= \frac{1}{2}(x+3y)(x-y)$

$= \frac{1}{2}(x^2-xy+3xy-3y^2)$

$= \frac{1}{2}(x^2+2xy-3y^2)$

$= \frac{x^2}{2}+\frac{2xy}{2}-\frac{3y^2}{2}$

$= \boxed{\frac{x^2+2xy-3y^2}{2}}$

5a) Volume of a cube $= (2x+1)(2x+1)(2x+1)$

use FOIL to expand $= (2x+1)(4x^2+2x+2x+1)$

collect like terms $= (2x+1)(4x^2+4x+1)$ apply distributive property again

$= 8x^3+8x^2+2x+4x^2+4x+1$

$= \boxed{8x^3+12x^2+6x+1}$

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

$= (x+1)(6x^2+9x-4x-6)$

$= (x+1)(6x^2+5x-6)$

$= 6x^3+5x^2-6x+6x^2+5x-6$

$= \boxed{6x^3+11x^2-x-6}$

FMPC 10

2.2, page 78

#4e,f

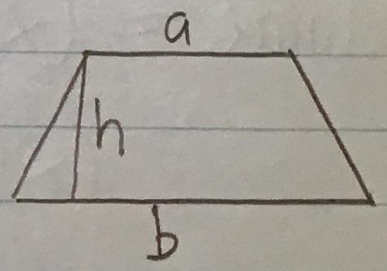
4e) Area of a parallelogram = base × height

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

$= 15x^2 - 10x + 3x - 2$

$= 15x^2 - 7x - 2$

4f) Area of a trapezoid = $\frac{a+b}{2} \times h$



FMPC 10

2.2, page 79

#6a

6a) $(x+1)^3 = (x+1)(x+1)(x+1)$

$= (x+1)(x^2+x+x+1)$

$= (x+1)(x^2+2x+1)$

$= x^3+2x^2+x+x^2+2x+1$

$= x^3+3x^2+3x+1$

FMPC 10

2.3, page 84

#5c

c) $3y(3y+1)-2(3y+1)$ let $A = 3y+1$

$\therefore \quad 3yA - 2A = A(3y-2)$

but $A = 3y+1 \quad \therefore \quad = (3y+1)(3y-2)$

FMPC 10

2.4, page 92

#8a

$3x^2 + 15x + 12 = 3(x^2 + 5x + 4)$

$= 3(x+1)(x+4)$

FMPC 10

2.4, page 93

#11a

a) $(2a+5)y^2+9(2a+5)y-10(2a+5)$

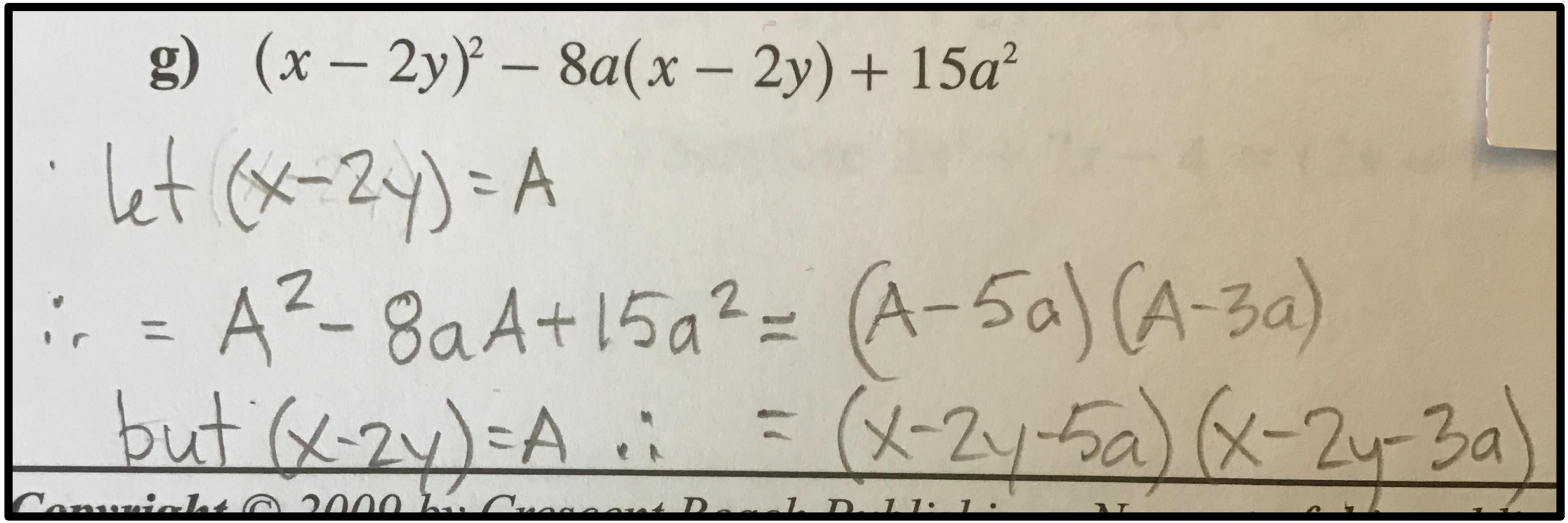
$=(2a+5)(y^2+9y-10)$

$=(2a+5)(y+10)(y-1)$

FMPC 10

2.4, page 93

#11g



g) $(x-2y)^2 - 8a(x-2y) + 15a^2$

let $(x-2y) = A$

$\therefore = A^2 - 8aA + 15a^2 = (A-5a)(A-3a)$

but $(x-2y) = A \therefore = (x-2y-5a)(x-2y-3a)$

FMPC 10

2.5, page 99

#3a,c

3a) $-3x^2-x+4 = -(3x^2+x-4)$

AC METHOD

$-(x^2+x-12)$

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

$-(x+\frac{4}{3})(x-\frac{3}{3})$

$= -(3x+4)(x-1)$

3b) $-2x^2-5xy-2y^2$

$= -(2x^2+5xy+2y^2)$

AC METHOD

$-(x^2+5xy+4y^2)$

$-(x+4y)(x+y)$

$-(x+\frac{4y}{2})(x+\frac{y}{2})$

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

3c) $-5x^2+2x+16$

$= -(5x^2-2x-16)$

AC METHOD

$-(x^2-2x-80)$

$-(x+8)(x-10)$

$-(x+\frac{8}{5})(x-\frac{10}{5})$

$= -(5x+8)(x-2)$

factors of -80	sum -2
1, -80	-79
2, -40	-38
4, -20	-16
5, -16	-11
8, -10	-2 ✓

FMPC 10

2.5, page 99

#3e,g

FMPC 10 2.5

3 e) $-100x^2+120xy-32y^2$ factor out -4

$= -4(25x^2-30xy+8y^2)$

AC METHOD: $x^2-30xy+200y^2$

factors +200	sum −30
−20, −10	

$(x-20y)(x-10y)$

$\left(x-\frac{20y}{25}\right)\left(x-\frac{10y}{25}\right)$

$\left(x-\frac{4y}{5}\right)\left(x-\frac{2y}{5}\right)$

$= -4(5x-4y)(5x-2y)$

3 g) $-6a^2-17ab+3b^2 = -(6a^2+17ab-3b^2)$

AC METHOD

$-(a^2+17ab-18b^2)$

$-(a+18)(a-1)$

$-\left(a+\frac{18}{6}\right)\left(a-\frac{1}{6}\right)$

$= -(a+3)(6a-1)$

FMPC 10
2.5, page 99
#4a

FMPC 10 2.5 p.99

4a) $25x^2(a-1)^3 - 5x(a-1)^3 - 2(a-1)^3$

each term contains $(a-1)^3$. We can factor this out and get

$(a-1)^3(25x^2-5x-2)$ ← factor this using the AC METHOD

$x^2-5x-50$

$(x-10)(x+5)$

$\left(x-\frac{10}{25}\right)\left(x+\frac{5}{25}\right)$

$\left(x-\frac{2}{5}\right)\left(x+\frac{1}{5}\right)$

$= (a-1)^3(5x-2)(5x+1)$

FMPC 10

2.7, page 109

#5s

FMPC 10 2.7 p.107-112

5.s) $x^2 - \frac{1}{2}x - \frac{15}{2}$

Get rid of the fractions by multiplying each term by the common denominator.

$2x^2 - x - 15$

Factor this using the AC METHOD

$x^2 - x - 30$

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

$(x-\frac{6}{2})(x+\frac{5}{2})$

$\boxed{(x-3)(x+\frac{5}{2})}$ ← we STOP HERE

CHECK BY EXPANDING THIS PRODUCT

$x^2 + \frac{5}{2}x - 3x - \frac{15}{2}$ use $3x = \frac{6}{2}x$

$x^2 + \frac{5}{2}x - \frac{6}{2}x - \frac{15}{2}$

$x^2 - \frac{1}{2}x - \frac{15}{2}$