

HW 72

A2

$$1. f(x) = (x^2 - 15x + \frac{225}{4}) + 3/2 - \frac{225}{4} \\ = (x - 15/2)^2 - 219/4$$

$$2. f(x) = 3(x^2 + 2x + 1) - 24 - 3 \\ f(x) = 3(x+1)^2 - 27$$

$$3. f(x) = 2(x^2 - 8x + 16) + 3 - 32 \\ = 2(x-4)^2 - 29$$

$$4. f(x) = 2(x^2 + 8x + 16) + 3 - 32 \\ = 2(x+4)^2 - 29$$

$$5. (x^2 + 15x + \frac{225}{4}) + 10 - \frac{225}{4} = 0 \\ (x + 15/2)^2 - 185/4 = 0 \\ (x + 15/2)^2 = \frac{185}{4} \\ x + 15/2 = \pm \frac{\sqrt{185}}{2} \\ x = -\frac{15}{2} \pm \frac{\sqrt{185}}{2}$$

$$6. 3(x^2 - 2x + 1) + 3 - 3 = 0 \\ 3(x-1)^2 = 0 \\ (x-1)^2 = 0 \\ x-1 = 0 \\ x = 1$$

$$7. 2(x^2 + 4x + 4) - 3 - 8 = 0 \\ 2(x+2)^2 - 11 = 0 \\ 2(x+2)^2 = 11 \\ (x+2)^2 = 11/2 \\ x+2 = \pm \sqrt{11/2} \\ x = -2 \pm \sqrt{11/2}$$

$$8. 3(x^2 - 3x + \frac{9}{4}) - 10 - \frac{27}{4} = 0 \\ 3(x - 3/2)^2 - 67/4 = 0$$

$$3(x - 3/2)^2 = 67/4$$

$$(x - 3/2)^2 = 67/12$$

$$x - 3/2 = \pm \sqrt{67/12}$$

$$x = 3/2 \pm \sqrt{67/12}$$

$$9. -32 = a(x+2)^2 - 36$$

$$4 = a(0+2)^2$$

$$4 = 4a$$

$$1 = a$$

$$VF: y = (x+2)^2 - 36$$

$$y = x^2 + 4x + 4 - 36$$

$$SF: y = x^2 + 4x - 32$$

$$FF: y = (x+8)(x-4)$$

$$10. 0 = a(x-3)^2 - 16$$

$$0 = a(-1-3)^2 - 16$$

$$16 = 16a$$

$$1 = a$$

$$VF: y = (x-3)^2 - 16$$

$$y = x^2 - 6x + 9 - 16$$

$$SF: y = x^2 - 6x - 7$$

$$FF: y = (x-7)(x+1)$$

$$11. -11 = a(-2-3)^2 - 3b$$

$$-11 = a(-5)^2 - 3b$$

$$25 = 25a$$

$$1 = a$$

$$VF: y = (x-3)^2 - 3b$$

$$y = x^2 - 6x + 9 - 3b$$

$$SF: y = x^2 - 6x - 27$$

$$FF: y = (x-9)(x+3)$$

$$12. y = a(x+4)(x-1)$$

$$28 = a(3+4)(3-2)$$

$$28 = a(7)(1)$$

$$4 = a$$

$$FF: y = 4(x+4)(x-1)$$

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

$$SF: y = 4x^2 + 12x - 16$$

$$y = 4(x^2 + 3x + \frac{9}{4}) - 16 - \frac{9}{4}$$

$$VF: y = 4(x + \frac{3}{2})^2 - 25$$

$$13. y = a(x+2)(x+5)$$

$$-15 = a(-7+2)(-7+5)$$

$$-15 = a(-5)(-2)$$

$$-1.5 = a$$

$$FF: y = -1.5(x+2)(x+5)$$

$$y = -1.5(x^2 + 7x + 10)$$

$$SF: y = -1.5x^2 - 10.5x - 15$$

$$y = -\frac{3}{2}(x^2 + 7x + \frac{49}{4}) - 15 - \frac{147}{8}$$

$$VF: y = -\frac{3}{2}(x + \frac{7}{2})^2 - \frac{27}{8}$$

$$14. y = a(x - \frac{1}{2})(x - 6)$$

$$-3b = a(2 - \frac{1}{2})(2 - 6)$$

$$-3b = a(1.5)(-4)$$

$$-3b = a(-6)$$

$$b = a$$

$$FF: y = b(x - \frac{1}{2})(x - 6)$$

$$y = b(x^2 - \frac{13}{2}x + 3)$$

$$SF: y = bx^2 - 39x + 18$$

$$y = b(x^2 - \frac{13}{2}x + \frac{119}{16}) + 18 - \frac{119b}{16}$$

$$VF: y = b(x - \frac{13}{4})^2 + \frac{119}{16}$$

15 & 16: see last page