

p. 22

#102

#1)  $f(x) = \frac{3}{4}x - \frac{1}{2}$

zero

$f(2) = \frac{3}{4}(2) - \frac{1}{2}$

$f(-2) = \frac{3}{4}(-2) - \frac{1}{2}$

$0 = \frac{3}{4}x - \frac{1}{2}$

$= \frac{3}{2} - \frac{1}{2} = \frac{2}{2} = 1$

$= -\frac{3}{2} - \frac{1}{2} = -2$

$f(2) = 1$   
 $(2, 1)$

$f(-2) = -2$   
 $(-2, -2)$

$0 = 3x - 2$

$2 = 3x$

$x = \frac{2}{3}$

#3)  $f(x) = 3x - 7$

does  $f(2) + f(6) = f(8)$

$f(2) = 3(2) - 7$   
 $= -1$

$f(6) = 3(6) - 7$   
 $= 11$

$f(8) = 3(8) - 7$   
 $= 17$

$-1 + 11 \stackrel{?}{=} 17$

$10 = 17$

NO !!

#7)  $f(x) = 1.5x - 2$

a) slope = 1.5

c) intercepts:

b) zero:  $0 = 1.5x - 2$   
 $2 = 1.5x$

$\frac{1\frac{1}{3}}$

x-int

y-int

$y=0$

$x=0$

$x = 1\frac{1}{3}$

$y = -2$

$(\frac{4}{3}, 0)$

$(0, -2)$

(p. 22)

$$\#11) f(1) = 5 \quad \text{and} \quad f(3) = 9$$

$$(1, 5)$$

$$(3, 9)$$

$$y - 9 = 2(x - 3)$$

$$y - 9 = 2x - 6$$

$$y = 2x + 3$$

$$\text{slope} = \frac{9 - 5}{3 - 1} = \frac{4}{2} = 2$$

$$f(x) = 2x + 3$$

$$\#12) g(-1) = -3 \quad \text{and} \quad g(-4) = 12$$

$$(-1, -3)$$

$$(-4, 12)$$

$$\text{slope} = \frac{12 + 3}{-4 + 1} = \frac{15}{-3} = -5$$

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

$$y + 3 = -5x - 5$$

$$y = -5x - 8$$

$$g(x) = -5x - 8$$

p. 28

$$\#1) \sqrt{-4} + \sqrt{-16} + \sqrt{-1}$$

$$2i + 4i + i =$$

7i

$$\#3) \sqrt{-1} \sqrt{-9}$$

$$i \cdot 3i$$

$$3i^2$$

$$3(-1) = -3$$

$$\#5) \frac{\sqrt{-12}}{\sqrt{-3}} = \sqrt{\frac{-12}{-3}} = \sqrt{4} = 2$$

$$\#7) (4-3i) + (-6+8i)$$

$$-2 + 5i$$

$$\#9) 4(3+5i) - 2(2-6i)$$

$$12 + 20i - 4 + 12i$$

$$8 + 32i$$

$$\#11)$$

$$(6-i)(6+i)$$

$$36 + 6i - 6i - i^2$$

$$36 - (-1) = 37$$

$$\#13) (5+i\sqrt{5})(5-i\sqrt{5})$$

$$25 - 5i\sqrt{5} + 5i\sqrt{5} - 5i^2$$

$$25 - 5i^2$$

$$25 - 5(-1)$$

$$30$$

$$\#15)$$

$$(8+3i)(2-5i)$$

$$16 - 40i + 6i - 15i^2$$

$$16 - 34i + 15$$

$$31 - 34i$$

$$\#17) (4-5i)^2$$

$$(4-5i)(4-5i)$$

$$16 - 20i - 20i + 25i^2$$

$$16 - 40i - 25$$

$$-9 - 40i$$

P. 28

$$\#19) \frac{1}{2+5i} \cdot \frac{2-5i}{2-5i} = \frac{2-5i}{4-25i^2} = \frac{2-5i}{29} = \frac{2}{29} - \frac{5}{29}i$$

$$\#21) \frac{5+i}{5-i} \cdot \frac{5+i}{5+i} = \frac{25+5i+5i+i^2}{25-i^2} = \frac{24+10i}{26} = \frac{12}{13} + \frac{5}{13}i$$

$$\#23) \frac{3+i\sqrt{2}}{7-i\sqrt{2}} \cdot \frac{(7+i\sqrt{2})}{(7+i\sqrt{2})} = \frac{21+3i\sqrt{2}+7i\sqrt{2}+2i^2}{49-2i^2}$$
$$= \frac{21+10i\sqrt{2}-2}{49+2} = \frac{19+10i\sqrt{2}}{51} = \frac{19}{51} + \frac{10\sqrt{2}}{51}i$$

$$\#25) \frac{5}{i} \cdot \frac{i}{i} = \frac{5i}{i^2} = \frac{5i}{-1} = -5i$$

$$\#27) i + i^2 + i^3 + i^4 + i^5$$
$$i + (-1) + (-i) + (1) + (i) = i$$

$$\#29) i^{-3} = i^1 = i$$
$$\#31) i^{-35} = i^{-31} = i^{-27} = i^{-23} = i^{-19} = i^{-15} = i^{-11} = i^{-7} = i^{-3} = i^1 = i$$

$$\#33) (2x+y) + (3-5x)i = 1-7i$$

$$2x+y=1$$

$$3-5x=-7$$

$$-5x=-10$$

$$x=2$$

$$2(2)+y=1$$

$$4+y=1$$

$$y=-3$$

$$x=2$$

$$y=-3$$