

ch 8

1) \emptyset
 2) $0 < x \leq 4$

3) $x \geq 2$

4) $-15 < -3x \leq -3 \Rightarrow 5 > x \geq 1 \Rightarrow 1 \leq x < 5$

5) $-8 < -2a + 4 \leq 0 \Rightarrow -12 < -2a \leq -4$
 $\Rightarrow 6 > a \geq 2 \Rightarrow 2 \leq a < 6$

6) $7x + 4 < 32$ and $6 - 5x > -19$
 $7x < 28$ and $-5x > -25$
 $x < 4$ and $x < 5 \Rightarrow x < 4$

7) $9x + 8 \geq -1$ and $5x + 2 \geq 22$
 $9x \geq -9$ and $5x \geq 20$
 $x \geq -1$ and $x \geq 4 \Rightarrow x \geq 4$

8) $4 < -4x \leq 6 \Rightarrow 3 < -4x \leq 5$
 $\Rightarrow -3/4 > x \geq -5/4 \Rightarrow -5/4 \leq x < -3/4$

9) $x \leq 3$ or $x \geq 5$

10) $-4x + 1 \geq 9$ or $5x + 3 \geq -17$
 $-4x \geq 8$ or $5x \geq -20$
 $x \leq -2$ or $x \geq -4 \Rightarrow \{x | x \text{ is real}\}$

ii) $75 \leq \frac{71 + 82 + 88 + x}{4} \leq 85$
 $300 \leq 241 + x \leq 340 \Rightarrow 59 \leq x \leq 99$

12) $| -3x - 7 | = 7 \Rightarrow -3x - 7 = 7$
 $3x = -8$ or $3x = -6 \Rightarrow x = -8/3$ or $x = -2$

13) $|n - 1| = |7 - n|$
 $n - 1 = 7 - n$ or $n - 1 = -(7 - n) = n - 7$
 $2n = 8$ or $-1 = -7$
 $n = 4$ or no solution $\Rightarrow n = 4$

14) $|b + 6| = -5 \Rightarrow$ No solution

15) $|4s - 7| = |7 - 4s|$
 $4s - 7 = 7 - 4s$ or $4s - 7 = -(7 - 4s)$
 $8s = 14$ or $4s - 7 = -7 + 4s$
 $s = 14/8 = 7/4$ or all real numbers
 \Rightarrow all real numbers

16) $| -2x - 1 | < 8 \Rightarrow -8 < -2x - 1 < 8$
 $-7 < -2x < 9 \Rightarrow 7/2 > x > -9/2$
 $\Rightarrow -9/2 < x < 7/2$

17) $|5y - 5| - 3 < -5 \Rightarrow |5y - 5| < -2$
 No solution

18) $|8 - 3x| \leq 6 \Rightarrow -6 \leq 8 - 3x \leq 6$
 $\Rightarrow -14 \leq -3x \leq -2 \Rightarrow 14/3 \geq x \geq 2/3$
 $\Rightarrow 2/3 \leq x \leq 14/3$

19) $|b - 3| \geq 11 \Rightarrow b - 3 \leq -11$ or $b - 3 \geq 11$
 $b \leq -8$ or $b \geq 14$

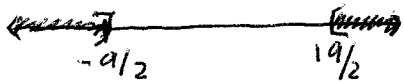
(Ch 8)

$$20) \left| \frac{5-2x}{7} \right| \geq 2 \Rightarrow |5-2x| \geq 14$$

$$5-2x \leq -14 \quad \text{or} \quad 5-2x \geq 14$$

$$-2x \leq -19 \quad \text{or} \quad -2x \geq 9$$

$$x \geq 19/2 \quad \text{or} \quad x \leq -9/2$$



$$(-\infty, -9/2] \cup [19/2, \infty)$$

$$21) |x+3| > 2$$

$$22) |x| < 7$$

$$23) D = \{ \text{Bob, Susan, Jim, Bruce} \}$$

$$R = \{ 86, 83, 76, 96 \}$$

$$24) D = \{ -5, 9, 5 \}, \quad R = \{ -2, -4, -5, 2 \}$$

25) Not a function

$$26) D = \mathbb{R} \text{ or all real numbers}$$

$$R = \{ y \mid y \leq 4.5 \}$$

$$27) D = \mathbb{R} \text{ or all real numbers}$$

$$R = \{ y \mid y \geq 2 \}$$

28) Yes (pass vertical line test)

29) No (Fails " ")

$$30) f(x) = x^3 + 2x^2 - 6x - 6$$

$$f(-4) = (-4)^3 + 2(-4)^2 - 6(-4) - 6$$

$$= -64 + 32 + 24 - 6 = -70 + 56$$

$$= \boxed{-14}$$

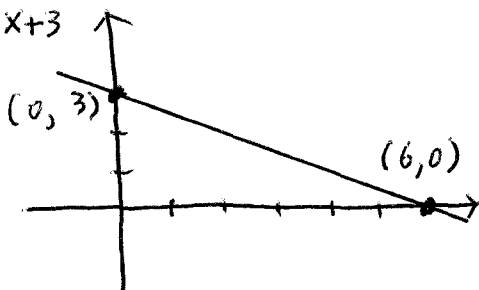
$$31) f(x) = 5x^2 - 3x - 9$$

$$f(-2) = 5(-2)^2 - 3(-2) - 9$$

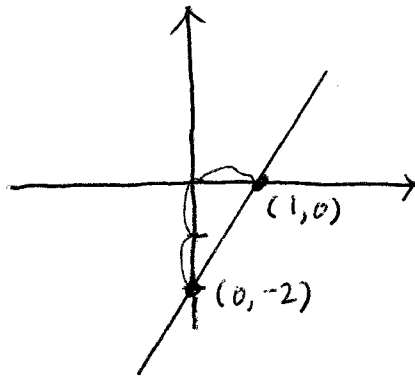
$$= 5(4) + 6 - 9 = 26 - 9 = \boxed{17}$$

$$32) f(3) = -3$$

$$33) f(x) = -\frac{1}{2}x + 3$$



$$34) f(x) = 2x - 2 = \frac{2}{1}x - 2$$



$$35) f - g = 15x^2 + 11x - 3$$

$$36) f + g = 11x^2 + 11x - 1$$

$$37) f \circ g = (x^2 - x - 8)(x - 1)$$

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

$$= x^3 - 2x^2 - 7x + 8$$

$$38) f \cdot g = (5x^2 + 2x + 4)(x^2 + 3x - 4)$$

$$= 5x^4 + 15x^3 - 20x^2$$

$$+ 2x^3 + 6x^2 - 8x$$

$$+ 4x^2 + 12x - 16$$

$$= 5x^4 + 17x^3 - 10x^2 + 4x - 16$$

$$39) f/g = \frac{-8x^2 + 12x}{-2x} = 4x - 6$$

$$40) f/g = x + 7 \overline{) \begin{array}{r} x^2 + 9x + 5 \\ -) x^2 + 7x \\ \hline 2x + 5 \\ -) 2x + 14 \\ \hline -9 \end{array}} \Rightarrow \left(x + 7 + \frac{-9}{x+7} \right)$$

$$41) (f \circ g)(-3) = f(-3) \circ g(-3)$$

$$= (-3 - 6) \circ [3(-3)^2 + 11(-3) + 4]$$

$$= (-9) \circ [27 - 33 + 4] = (-9) \circ [-2]$$

$$= 18$$