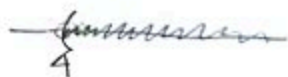


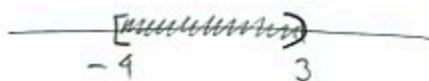
Write interval notation and sketch on the number line.

1. (3pts)  $\{x|x > 4\}$



$(4, \infty)$

2. (3pts)  $\{x|-4 \leq x < 3\}$



$[-4, 3)$

Solve the equations.

3. (3pts)  $2x + 11 = 4x - 9$  |  $-4x$

$-2x + 11 = -9$  |  $-11$

$-2x = -20$

$x = \frac{-20}{-2} = 10$

4. (4pts)  $6(3x + 1) - 4x = 4 - 5(x - 2)$

$18x + 6 - 4x = 4 - 5x + 10$  |  $+5x$

$14x + 6 = 14$  |  $-6$

$14x = 8$

$x = \frac{8}{14}$

Simplify and write in standard form:

5. (4pts)  $3x^2(x + 1) - (2x^2 - 1)(x + 6) =$

$= 3x^3 + 3x^2 - (2x^3 + 12x^2 - x - 6)$

$= 3x^3 + 3x^2 - 2x^3 - 12x^2 + x + 6$

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

6. (4pts)  $(5x + 1)(3x^2 - 7x - 9) = 5x \cdot (3x^2 - 7x - 9) + 1 \cdot (3x^2 - 7x - 9)$

$= 15x^3 - 35x^2 - 45x + 3x^2 - 7x - 9$

$= 15x^3 - 32x^2 - 52x - 9$

Simplify and write the answer so all exponents are positive:

7. (2pts)  $(5x)^2 x^5 = 25x^2 x^5 = 25x^7$

8. (2pts)  $\frac{(7y)^2}{y^5} = \frac{49y^2}{y^5} = 49y^{-3} = \frac{49}{y^3}$

9. (3pts)  $(4x^2y)^2 x^5 y^2 = 16x^4 y^2 x^5 y^2 = 16x^9 y^4$

10. (5pts)  $(4x^{-2}y^4)^3 (x^3y^{-2})^4 =$   
 $= 64x^{-6}y^{12} x^{12}y^{-8} = 64x^6y^4$

11. (7pts)  $\frac{(3u^7v^{-3})^3}{(6u^3v^{-4})^2} = \frac{27u^{21}v^{-9}}{\frac{36u^6v^{-8}}{4}} = \frac{3u^{15}v^{-1}}{4} = \frac{3u^{15}}{4v}$

Factor the following.

12. (4pts)  $x^2 + 13x + 40 =$   $\begin{matrix} \text{prod} = 40 \\ \text{sum} = 13 \\ 5, 8 \end{matrix}$   
 $= (x+5)(x+8)$

13. (4pts)  $x^2 - 3x - 54 =$   $\begin{matrix} \text{prod} = -54 \\ \text{sum} = -3 \\ -9, 6 \end{matrix}$   
 $= (x-9)(x+6)$

Solve the equations.

14. (6pts)  $x^2 - 13 = -13x + 1$   $\left| +13x - 1 \right.$   
 $x^2 + 13x - 14 = 0$   
 $(x+14)(x-1) = 0$   
 $x+14=0$  or  $x-1=0$   
 $x = -14, 1$

15. (6pts)  $x^2 + 2x - 1 = 20 - 2x$   $\left| -20 + 2x \right.$   
 $x^2 + 4x - 21 = 0$   
 $(x+7)(x-3) = 0$   
 $x+7=0$  or  $x-3=0$   
 $x = -7, 3$