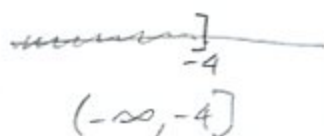
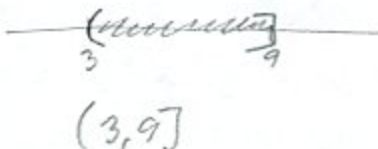


Write the sets in interval notation and sketch them on the number line.

1. (3pts) $\{x \mid x \leq -4\}$



2. (3pts) $\{x \mid 3 < x \leq 9\}$



Solve the equations.

3. (3pts) $4x + 1 = 7x - 5 \quad | -4x$

$$1 = 3x - 5 \quad | +5$$

$$6 = 3x \quad | \div 3$$

$$x = \frac{6}{3} = 2$$

4. (4pts) $5(3 - 2v) = 4 - 2(v - 2)$

$$15 - 10v = 4 - 2v + 4$$

$$15 - 10v = 8 - 2v \quad | +10v$$

$$15 = 8 + 8v \quad | -8$$

$$7 = 8v \quad | \div 8$$

$$v = \frac{7}{8}$$

Simplify and write in standard form:

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

$$= 15x^2 + 5x - 6x - 2 - x^3 - 5x^2$$

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

6. (4pts) $(x - 7)^2 - (x - 3)^2 = (x - 7)(x - 7) - (x - 3)(x - 3)$

$$= x^2 - 7x - 7x + 49 - (x^2 - 3x - 3x + 9)$$

$$= x^2 - 14x + 49 - x^2 + 6x - 9$$

$$= -8x + 40$$

Simplify and write the answer so all exponents are positive:

7. (2pts) $(2b)^3 b^4 = 2^3 b^3 b^4 = 8b^7$

8. (2pts) $\frac{v^2}{(3v)^4} = \frac{v^2}{3^4 v^4} = \frac{v^{-2}}{81} = \frac{1}{81v^2}$

9. (3pts) $y^{-2}(x^3 y)^{-2} x^2 = y^{-2} x^{-6} y^{-2} x^2 = x^{-4} y^{-4} = \frac{1}{x^4 y^4}$

10. (5pts) $(2r^3 s^{-2})^4 (u^{-1} v^2)^{-3} = 2^4 r^{12} s^{-8} u^3 v^{-6}$

$$= \frac{16 r^{12} u^3}{s^8 v^6}$$

11. (7pts) $\frac{(6x^2 y^{-2})^3}{(3x^5 y^4)^2} = \frac{6^3 x^6 y^{-6}}{3^2 x^{10} y^8} = \frac{6^2 \cancel{6}^2 x^{-4} y^{-14}}{\cancel{3}^2 \cancel{3}^2 x^{14} y^{14}} = \frac{24}{x^4 y^{14}}$

Factor the following.

12. (4pts) $x^2 + 3x - 28 =$

prod = -28
sum = 3
7, -4
 $(x+7)(x-4)$

13. (4pts) $x^2 - 12x + 20 = (x-10)(x-2)$

prod = 20
sum = -12
-10, -2

Use the ac-method or another method to factor. Show how you got your answer.

14. (6pts) $2x^2 - 5x - 12 =$

prod = -24
sum = -5
-8, 3
 $= 2x^2 - 8x + 3x - 12$
 $= 2x(x-4) + 3(x-4)$
 $= (2x+3)(x-4)$

15. (6pts) $6x^2 + 11x - 2 =$

prod = -12
sum = 11
-12, 1
 $= 6x^2 + 12x - x - 2$
 $= 6x(x+2) - (x+2)$
 $= (6x-1)(x+2)$