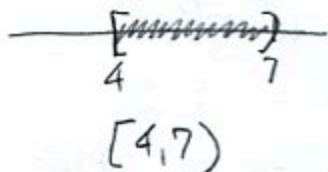
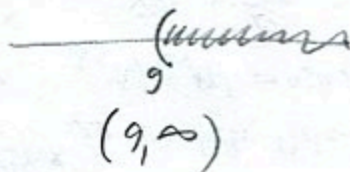


Write interval notation and sketch on the number line.

1. (3pts) $\{x|4 \leq x < 7\}$



2. (3pts) $\{x|x > 9\}$



Solve the equations.

3. (3pts) $2x - 6 = 5x + 9 \quad | -5x$

$$-3x - 6 = 9 \quad | +6$$

$$-3x = 15 \quad | \div (-3)$$

$$x = -5$$

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

$$1 - 6x + 2 - x = 4x - 12$$

$$3 - 7x = 4x - 12 \quad | +7x$$

$$3 = 11x - 12 \quad | +12$$

$$15 = 11x$$

$$x = \frac{15}{11}$$

Simplify and write in standard form:

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

$$= x^3 + 4x^2 - x - 7x^2 - 28x + 7 - 3x^3$$

$$= -2x^3 - 3x^2 - 29x + 7$$

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

$$2x^3 + 4x^2 - (x^2 - 2x + 3x - 6)$$

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

$$= 2x^3 + 4x^2 - x^2 - x + 6$$

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

Simplify and write the answer so all exponents are positive:

7. (2pts) $z^2(4z)^3 = z^2 \cdot 4^3 z^3 = z^2 \cdot 64 \cdot z^3 = 64z^5$

8. (2pts) $\frac{(2x)^3}{x^7} = \frac{2^3 x^3}{x^7} = 8x^{-4} = \frac{8}{x^4}$

9. (3pts) $(u^2v^3)^4 u^3v = (u^2)^4 (v^3)^4 u^3v = u^8 v^{12} u^3 v = u^{11} v^{13}$

10. (5pts) $(7xy^{-2})^2(x^{-4}y^2)^3 = 7^2 x^2 (y^{-2})^2 (x^{-4})^3 (y^2)^3$
 $= 49 x^2 y^{-4} x^{-12} y^6 = 49 x^{-10} y^2 = \frac{49y^2}{x^{10}}$

11. (7pts) $\frac{(6w^5z^{-2})^2}{(3w^{-3}z^5)^3} = \frac{6^2 (w^5)^2 (z^{-2})^2}{3^3 (w^{-3})^3 (z^5)^3} = \frac{36 w^{10} z^{-4}}{27 w^{-9} z^{15}} = \frac{4}{3} w^{19} z^{-19} = \frac{4w^{19}}{3z^{19}}$

Factor the following.

12. (4pts) $x^2 + 7x + 12 =$

prod = 12 $(x+3)(x+4)$

sum = 7

3, 4

13. (4pts) $x^2 - 9x - 36 = (x-12)(x+3)$

prod = -36

sum = -9

-12, 3

Solve the equations.

14. (6pts) $x^2 + 1 = 2x + 16 \quad | -2x - 16$

$x^2 - 2x - 15 = 0$

$(x-5)(x+3) = 0$

$x = 5, -3$

15. (6pts) $2x^2 - 10x + 4 = x^2 - 5 \quad | -x^2 + 5$

$x^2 - 10x + 9 = 0$

$(x-1)(x-9) = 0$

$x = 1, 9$