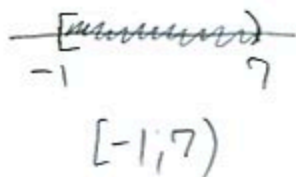
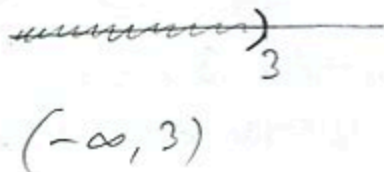


Write interval notation and sketch on the number line.

1. (3pts) $\{x \mid -1 \leq x < 7\}$



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



Solve the equations.

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

$$-2x + 2 = -9 \quad | -2$$

$$-2x = -11$$

$$x = \frac{-11}{-2} = \frac{11}{2}$$

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

$$3x - 14x - 7 = 5x - 10 + 4 \quad | +7$$

$$-11x = 5x + 1 \quad | -5x$$

$$-16x = 1$$

$$x = \frac{1}{-16} = -\frac{1}{16}$$

Simplify and write in standard form:

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

$$\begin{aligned} & 2x^4 + 2x - (3x^2 - 6x - 2x + 4) \\ &= 2x^4 + 2x - 3x^2 + 8x - 4 \\ &= 2x^4 - 3x^2 + 10x - 4 \end{aligned}$$

6. (4pts) $(3x^2 - x)(5x^2 + 3x - 4) = 15x^4 + 9x^3 - 12x^2 - 5x^3 - 3x^2 + 4x$

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

Simplify and write the answer so all exponents are positive:

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

8. (2pts) $\frac{(3y)^2}{y^3} = \frac{3^2 y^2}{y^3} = 9y^{-1} = \frac{9}{y}$

9. (3pts) $(3xy)^3 x^2 y^3 = 3^3 x^3 y^3 x^2 y^3 = 27x^5 y^6$

10. (5pts) $(2x^{-5}y^{-2})^2(3x^{-2}y^2)^4 = 2^2 x^{-10} y^{-4} \cdot 3^4 x^{-8} y^8$
 $= 4 \cdot 81 x^{-18} y^4 = \frac{324 y^4}{x^{18}}$

11. (7pts) $\frac{(6a^{-5}b^3)^2}{(4a^3b^{-2})^3} = \frac{6^2 a^{-10} b^6}{4^3 a^9 b^{-6}} = \frac{36 a^{-19} b^{12}}{64} = \frac{9 b^{12}}{16 a^{19}}$

Factor the following.

12. (4pts) $x^2 - 13x + 42 =$
 $= (x-6)(x-7)$
 prod = 42
 sum = -13
 -6, -7

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

Solve the equations.

14. (6pts) $x^2 - 4 = 5x + 10 \quad | -5x - 10$
 $x^2 - 5x - 14 = 0$
 $(x-7)(x+2) = 0$
 $x-7=0$ or $x+2=0$
 $x = 7, -2$

15. (6pts) $x^2 + 2x = 3x + 12 \quad | -3x - 12$
 $x^2 - x - 12 = 0$
 $(x-4)(x+3) = 0$
 $x-4=0$ or $x+3=0$
 $x = 4, -3$