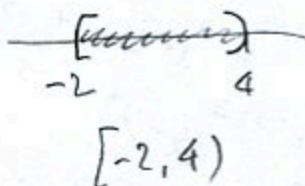
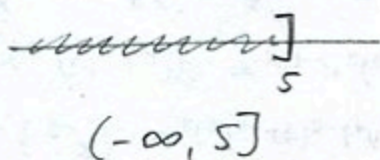


Write interval notation and sketch on the number line.

1. (3pts) $\{x | -2 \leq x < 4\}$



2. (3pts) $\{x | x \leq 5\}$



Solve the equations.

3. (3pts) $2x - 6 = -3x + 4 \quad | +6$

$$2x = -3x + 10 \quad | +3x$$

$$5x = 10 \quad | \div 5$$

$$x = 2$$

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

$$5z - 15 - 1 = z + 8z + 12$$

$$5z - 16 = 9z + 12 \quad | -9z + 16$$

$$-4z = 28 \quad | \div -4$$

$$z = -7$$

Simplify and write in standard form:

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

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

$$= x^3 + 4x^2 + 4x + 2x^2 + 8x + 8 - 4x^2 + x$$

$$= x^3 + 2x^2 + 13x + 8$$

6. (4pts) $x(2x + 3) - (x - 7)(x + 3) = 2x^2 + 3x - (x^2 - 7x + 3x - 21)$

$$= 2x^2 + 3x - x^2 + 4x + 21$$

$$= x^2 + 7x + 21$$

Simplify and write the answer so all exponents are positive:

7. (2pts) $a^2(2b)^4 = a^2 \cdot 2^4 \cdot b^4 = 16a^2b^4$

8. (2pts) $\frac{(3x)^2}{x^5} = \frac{3^2 x^2}{x^5} = 9x^{-3} = \frac{9}{x^3}$

9. (3pts) $(u^4v^{-5})^2 u^{-4}v^3 = (u^4)^2 (v^{-5})^2 u^{-4}v^3 = u^8 v^{-10} u^{-4} v^3 = u^4 v^{-7} = \frac{u^4}{v^7}$

10. (5pts) $(x^{-5}y^4)^{-2}(4x^{-3}y^5)^3 = (x^{-5})^{-2} (y^4)^{-2} 4^3 (x^{-3})^3 (y^5)^3$
 $= x^{10} y^{-8} \cdot 64 \cdot x^{-9} y^{15} = 64xy^7$

11. (7pts) $\frac{(6u^{-2}v^5)^3}{(8u^4v^{-3})^2} = \frac{6^3 (u^{-2})^3 (v^5)^3}{8^2 (u^4)^2 (v^{-3})^2} = \frac{216 u^{-6} v^{15}}{8 \cdot 64 u^8 v^{-6}} = \frac{27 u^{-14} v^{21}}{8} = \frac{27v^{21}}{8u^{14}}$

Factor the following.

12. (4pts) $x^2 - 5x - 14 =$

$(x-7)(x+2)$

prod = -14 -7, 2
 sum = -5

13. (4pts) $x^2 + 8x - 48 =$

$(x+12)(x-4)$

prod = -48 12, -4
 sum = 8

Solve the equations.

14. (6pts) $x^2 + 3x = 2x + 20 \quad | -2x - 20$

$x^2 + x - 20 = 0$

$(x+5)(x-4) = 0$

$x+5=0$ or $x-4=0$

$x=-5$ or $x=4$

15. (6pts) $2x^2 - 10x + 5 = x^2 - 16 \quad | -x^2 + 16$

$x^2 - 10x + 21 = 0$

$(x-7)(x-3) = 0$

$x-7=0$ or $x-3=0$

$x=7$ or $x=3$