A) $x^3y^2 + xy^2 - 5xy^3$

$xy^2(x^2 + 1 - 5y)$

B) $(3m)(9n-2) + 8(9n-2)$

$(9n-2)(3m+8)$

C) $-27x^3 + 18x^2 - 3x$

$-3x(9x^2 - 6x + 1)$

$-3x(3x-1)(3x-1)$ or $-3x(3x-1)^2$

D) $15x^2 + 10xy - 6x - 4y$

$5x(3x+2y) - 2(3x+2y)$

$(3x+2y)(5x-2)$

E) $18xy - 4y^2 + 36x - 8y$

$2(9xy - 2y^2 + 18x - 4y)$

$2[y(9x-2y) + 2(9x-2y)]$

$2[(9x-2y)(y+2)]$

$2(9x-2y)(y+2)$

F) $5z^2 + 12z + 7$

$5 \cdot 7 = 35$ → $5 + 7$

$5z^2 + 5z + 7z + 7$

$5z(z+1) + 7(z+1)$

$(z+1)(5z+7)$

G) $mn - 9m - n + 9$

$m(n-9) - 1(n-9)$

$(n-9)(m-1)$

H) $63c^2 - 28d^2$

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

$7(9c^2 - 4d^2)$

$7((3c)^2 - (2d)^2)$

$x \quad y$

$7(3c-2d)(3c+2d)$

I) $8m^3 + 125p^3$

$a^3 + b^3 = (a+b)(a^2 - ab + b^2)$

$(2m)^3 + (5p)^3$

$a \quad b$

$(2m+5p)((2m)^2 - (2m)(5p) + (5p)^2)$

$(2m+5p)(4m^2 - 10mp + 25p^2)$

J) $9v^2+14v-8$ $\quad -72 \to 18, -4$

$9v^2+18v-4v-8$

$9v(v+2)-4(v+2)$

$(v+2)(9v-4)$

K) $x^2+2xy+y^2-16z^2$

$x(x+2y)$

$x^2+2xy+y^2-16z^2$

$(x+y)(x+y)-16z^2$

$(x+y)^2-16z^2$

$(x+y)^2-(4z)^2$

$(x+y-4z)(x+y+4z)$

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

A) $|8x-5|=13$

$8x-5=13$ or $8x-5=-13$

$+5 \quad +5$ $+5 \quad +5$

$\frac{8x}{8}=\frac{18}{8}$ $\frac{8x}{8}=\frac{-8}{8}$

$x=\frac{18}{8}$ or $x=-1$

$x=\frac{9}{4}$

B) $|4x+2|=|5x-1|$

$4x+2=5x-1$ or $4x+2=-(5x-1)$

$-4x \quad -4x$

$2=x-1$ $4x+2=-5x+1$

$+1 \quad +1$ $+5x \quad +5x$

$3=x$ $9x+2=1$

$-2 \quad -2$

$\frac{9x}{9}=\frac{-1}{9}$

$x=-\frac{1}{9}$

C) $|7-2x|=11$

$7-2x=11$ or $7-2x=-11$

$-7 \quad -7$ $-7 \quad -7$

$\frac{-2x}{-2}=\frac{4}{-2}$ $\frac{-2x}{-2}=\frac{-18}{-2}$

$x=-2$ $x=9$

A) $5(1-2x) \leq 9(x-3)$

$5 - 10x \leq 9x - 27$

$+10x \quad +10x$

$5 \leq 19x - 27$

$+27 \quad +27$

$\frac{32}{19} \leq \frac{19x}{19}$

$\frac{32}{19} \leq x$ or $x \geq \frac{32}{19}$

$\left[\frac{32}{19}, \infty\right)$

B) $-7 < 5x + 8 \leq 28$

$-8 \quad -8 \quad -8$

$\frac{-15}{5} < \frac{5x}{5} \leq \frac{20}{5}$

$-3 < x \leq 4$

$(-3, 4]$

c) $|4x+1| < 17$

$-17 < 4x+1 < 17$

$-1 \quad -1 \quad -1$

$-18 < 4x < 16$

$\frac{-18}{4} < \frac{4x}{4} < \frac{16}{4}$

$-\frac{9}{2} < x < 4$

$\left(-\frac{9}{2}, 4\right)$

d) $|2x-1| \geq 5$

$2x-1 \geq 5$ or $2x-1 \leq -5$

$+1 \quad +1$ $+1 \quad +1$

$\frac{2x}{2} \geq \frac{6}{2}$ $\frac{2x}{2} \leq \frac{-4}{2}$

$x \geq 3$ or $x \leq -2$

$(-\infty, -2] \cup [3, \infty)$

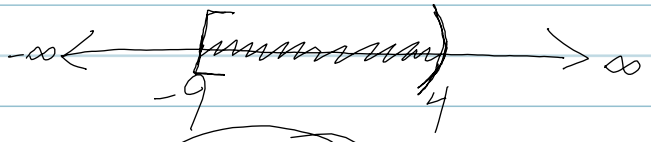
E) $-21 \leq 3(x+2) < 18$

$-21 \leq 3x+6 < 18$

$-6 \quad -6 \quad -6$

$\frac{-27}{3} \leq \frac{3x}{3} < \frac{12}{3}$

$-9 \leq x < 4$



$[-9, 4)$

F) $|7+2x| \leq 11$

$-11 \leq 7+2x \leq 11$

$-7 \quad -7 \quad -7$

$\frac{-18}{2} \leq \frac{2x}{2} \leq \frac{4}{2}$

$-9 \leq x \leq 2$

$[-9, 2]$

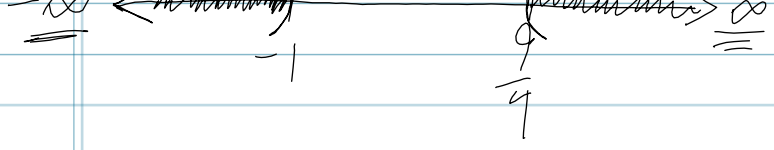
G) $|8x-5| > 13$

$8x-5 > 13$ or $8x-5 < -13$

$+5 \quad +5 \qquad +5 \quad +5$

$\frac{8x}{8} > \frac{18}{8}$ $\qquad$ $\frac{8x}{8} < \frac{-8}{8}$

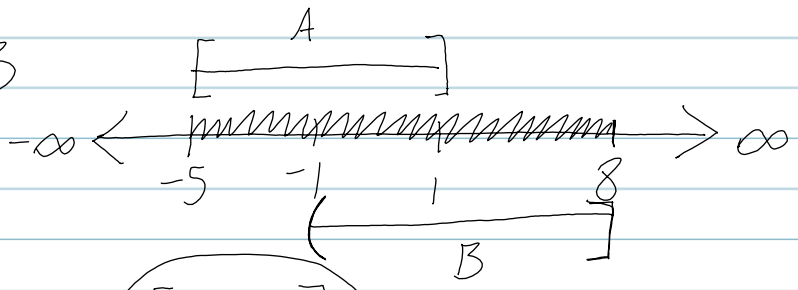
$x > \frac{9}{4}$ or $x < -1$



$(-\infty, -1) \cup (\frac{9}{4}, \infty)$

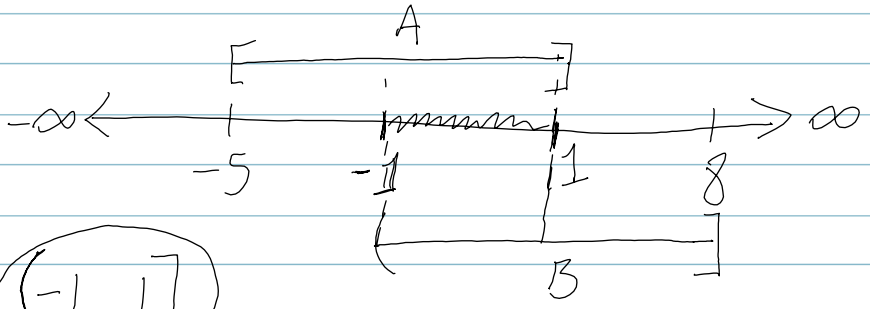
$A = [-5, 1]$ and $B = (-1, 8]$

A) $A \cup B$



$[-5, 8]$

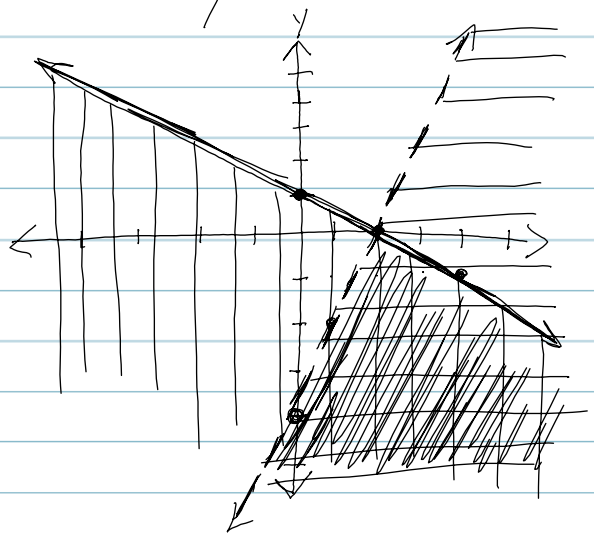
B) $A \cap B$



$(-1, 1]$

A) $x + 2y \leq 2$

$2x - y > 4$



$x + 2y \leq 2$

$-x \quad -x$

$\frac{2y}{2} \leq \frac{-x}{2} + \frac{2}{2}$

$y \leq -\frac{1}{2}x + 1$

test (0,0)

$0 \leq -\frac{1}{2}(0) + 1$

$0 \leq 0 + 1$

$0 \leq 1$

$2x - y > 4$

$-2x \quad -2x$

$\frac{-y}{-1} > \frac{-2x}{-1} + \frac{4}{-1}$

$y < 2x - 4$

test (0,0)

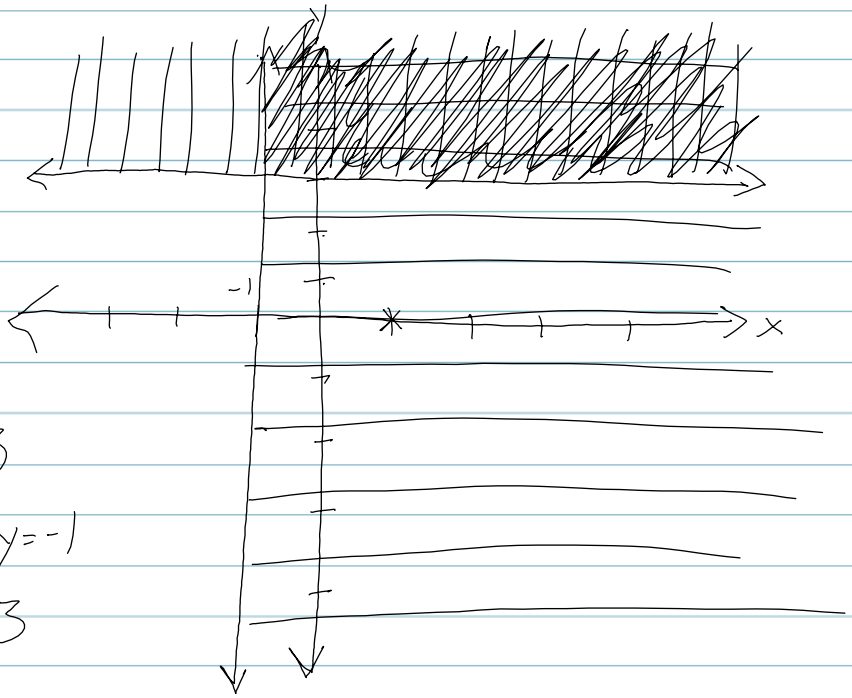
$0 < 2(0) - 4$

$0 < 0 - 4$

$0 < -4$

B) $x \geq -1$

$y \geq 3$



$x \geq -1$

test $x = 1$

$1 \geq -1$

$y \geq 3$

test $y = -1$

$-1 \geq 3$

A) $x^2+10x=-21$
$+21 \quad +21$

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

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

$x+7=0 \quad x+3=0$
$-7 \quad -7 \quad -3 \quad -3$

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

B) $18\left(\frac{x^2}{18}\right)+\frac{3}{18}\left(\frac{x}{1}\right)-(1)^{(18)}=0(18)$

$x^2+3x-18=0$ (3.6, 1.18, 2.9)

$(x+6)(x-3)=0$

$x+6=0 \quad x-3=0$
$-6 \quad -6 \quad +3 \quad +3$

$x=-6$ or $x=3$

C) $(x+6)(x-2)=9$

$x^2-2x+6x-12=9$

$x^2+4x-12=9$
$-9 \quad -9$ (1.21, 7.3)

$x^2+4x-21=0$

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

$x+7=0 \quad$ or $\quad x-3=0$
$-7 \quad -7 \quad +3 \quad +3$

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

D) $5x^2=3x+2$
$-3x-2 \quad -3x-2$

$5x^2-3x-2=0$ (-10, 1.10, 2.5)

$5x^2-5x+2x-2=0$

$5x(x-1)+2(x-1)=0$

$(x-1)(5x+2)=0$

$x-1=0 \quad$ or $\quad 5x+2=0$
$+1 \quad +1 \quad -2 \quad -2$

$x=1$ or $\frac{5x}{5}=\frac{-2}{5}$

$x=-\frac{2}{5}$

$5x^2=3x+2$
$-5x^2 \quad -5x^2$
$0=-5x^2+3x+2$

factor out -1 first

A) Six times the quantity w minus eleven is at least ninety-six more than five times w.

$6(w-11) \geq 5w+96$

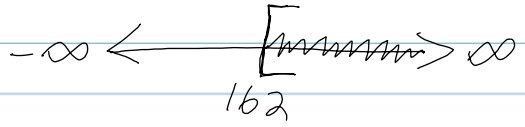
$6w-66 \geq 5w+96$

$-5w \quad -5w$

$w-66 \geq 96$

$+66 \quad +66$

$w \geq 162$



$[162, \infty)$

B) Twice the sum of y and fifteen never exceeds the quotient of y and 3.

$2(y+15) \leq \frac{y}{3}$

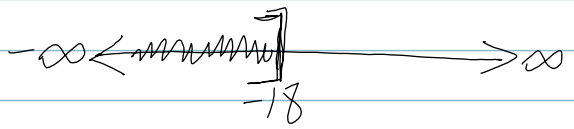
$(3)2y+(30)3 \leq \left(\frac{y}{3}\right)\cdot 3$

$6y+90 \leq y$

$-6y \quad -6y$

$\frac{90}{-5} \leq \frac{-5y}{-5}$

$-18 \geq y$



$(-\infty, -18]$

minimum charge: $3.50
additional charge: $0.25 per 0.1 mile

d = # of 0.1's of a mile

How many miles if you have at most $30.25 to spend?

$$3.50 + 0.25(d) \leq 30.25$$
$$-3.50 \qquad -3.50$$
$$\frac{0.25}{0.25}d \leq \frac{26.75}{0.25}$$
$$d \leq 107 \text{ tenth of a mile}$$
$$\frac{107}{10} = \boxed{10.7 \text{ miles at most}}$$