Topic 1 // worksheet A

1) A) $\frac{6}{7} \rightarrow \boxed{\frac{7}{6}}$ B) $3 \rightarrow \boxed{\frac{1}{3}}$ C) $-\frac{8}{5} \rightarrow \boxed{-\frac{5}{8}}$ D) $-2\frac{1}{2}$ $-\frac{5}{2} \rightarrow \boxed{-\frac{2}{5}}$

2) A) $-3\frac{1}{2} \rightarrow \boxed{3\frac{1}{2}}$ B) $5 \rightarrow \boxed{-5}$ C) $\frac{1}{2} \rightarrow \boxed{-\frac{1}{2}}$

3) A) $6(2c+3) = \boxed{12c+18}$ B) $3(6y-2) = \boxed{18y-6}$

C) $-4(7-8x) = \boxed{-28+32x}$ D) $(3n-9)2 = \boxed{6n-18}$

E) $a(b+5) = \boxed{ab+5a}$ F) $-3(2a+b) = \boxed{-6a-3b}$

4) A) $-9 \cdot 4 = \boxed{-36}$ B) $5 + 3\frac{1}{2} = \boxed{8\frac{1}{2}}$

C) $8 \div -4 = \boxed{-2}$ D) $-4 \div 8 = \boxed{-\frac{1}{2}}$

E) $-8 - 5 = \boxed{-13}$ F) $5 - -8 = \boxed{13}$

5) A) $4(-3)^2 - (-3) + 3$

$4(9) + 3 + 3$

$36 + 3 + 3$

$\boxed{42}$

B) $2(3)^2 + (3 + 1)$

$2(9) + (4)$

$18 + 4$

$\boxed{22}$

C) $(2 - 5n) \div n^2$

$(2 - 5(2)) \div 2^2$

$(2 - 10) \div 4$

$-8 \div 4$

$\boxed{-2}$

D) $8\left(\frac{1}{4}\right) - 3(-1)^2$

$2 - 3(1)$

$2 - 3$

$\boxed{-1}$

6) A) $-1 < x < 4$

B) $x > 3$ or $x \leq -2$

7) A) $\frac{P}{\pi} = \frac{\pi T}{\pi}$

$\boxed{T = P/\pi}$

B) $5n + 2k = 8$

$-2k \quad -2k$

$\frac{5n}{5} = \frac{8-2k}{5}$

$\boxed{n = \frac{8-2k}{5}}$

C) $(2)A = \frac{1}{2}Bh\,(2)$

$\frac{2A}{h} = \frac{Bh}{h}$

$\boxed{B = \frac{2A}{h}}$

D) $\frac{A}{5} = \frac{5(c-b)}{5}$

$\frac{A}{5} = c - b$

$+b \quad +b$

$\boxed{c = \frac{A}{5} + b}$

E) $ay - 3y = n$

$\frac{y(a-3)}{a-3} = \frac{n}{a-3}$

$\boxed{y = \frac{n}{a-3}}$

F) $c^2x + 7x = T$

$\frac{x(c^2+7)}{c^2+7} = \frac{T}{c^2+7}$

$\boxed{x = \frac{T}{c^2+7}}$

G) $L = Pn^3 + P$

$\frac{L}{n^3+1} = \frac{P(n^3+1)}{n^3+1}$

$\boxed{P = \frac{L}{n^3+1}}$

H) $\frac{3}{2}A = \frac{2}{3}(m+c)\left(\frac{3}{2}\right)$

$\frac{3}{2}A = m + c$

$-c \quad -c$

$\boxed{m = \frac{3}{2}A - c}$

8) $5(x-3) + 8 = -1$

$-8 \quad -8$

$\frac{5(x-3)}{5} = \frac{-6}{5}$

$x - 3 = \frac{-6}{5}$

$+3 \quad +3$

$x = \frac{-6}{5} + \frac{15}{5}$

$\boxed{x = 9/5}$

B) $8x - (2x - 5) = 3x + 4$

$8x - 2x + 5 = 3x + 4$

$6x + 5 = 3x + 4$

$-3x \quad -5 \quad -3x \quad -5$

$\frac{3x}{3} = \frac{-1}{3}$

$\boxed{x = -1/3}$

C) $12\left(\frac{3}{4}n + \frac{1}{6}n\right) = 4(12)$

$9n + 2n = 48$

$\frac{11n}{11} = \frac{48}{11}$

$\boxed{n = 48/11}$

D) $-3(2-2y) + (3y-1) = 2(4-2y)$

$-6 + 6y + 3y - 1 = 8 - 4y$

$9y - 7 = 8 - 4y$

$+4y \quad +7 \quad +7 \quad +4y$

$\frac{13y}{13} = \frac{15}{13}$

$\boxed{y = 15/13}$

9) A) $4c - 3 < 9$

$+3 \quad +3$

$\frac{4c}{4} < \frac{12}{4}$

$\boxed{c < 3}$

B) $-8y + 2(y-3) \geq 12$

$-8y + 2y - 6 \geq 12$

$+6 \quad +6$

$\frac{-6y}{-6} \geq \frac{18}{-6} \rightarrow \boxed{y \leq -3}$

C) $5n + 8 > 3n + 2$

$-3n \quad -8 \quad -3n \quad -8$

$\frac{2n}{2} > \frac{-6}{2}$

$\boxed{n > -3}$

D) $-y - (3y+7) \leq 2(y+1)$

$-y - 3y - 7 \leq 2y + 2$

$-4y - 7 \leq 2y + 2$

$-2y \quad +7 \quad -2y \quad +7$

$\frac{-6y}{-6} \leq \frac{9}{-6} \rightarrow \boxed{y \geq -\frac{3}{2}}$

E) $2 + (1 - x) > 4(2x - 3)$

$2 + 1 - x > 8x - 12$

$3 - x > 8x - 12$

$-3 \quad -8x \quad -8x \quad -3$

$\frac{-9x}{-9} > \frac{-15}{-9}$

$\boxed{x < 5/3}$

F) $-\frac{1}{8}y + 2 \leq -5$

$-2 \quad -2$

$(-8) -\frac{1}{8}y \leq -7 (-8)$

$\boxed{y \geq 56}$

10) A) $|3x+2| = 10$

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

$-2 \quad -2$ $\quad$ $-2 \quad -2$

$\frac{3x}{3} = \frac{8}{3}$ $\quad$ $\frac{3x}{3} = \frac{-12}{3}$

$\boxed{x = 8/3}$ $\quad$ $\boxed{x = -4}$

B) $\left|\frac{1}{2}x - 4\right| = 2$

$\frac{1}{2}x - 4 = 2$ or $\frac{1}{2}x - 4 = -2$

$+4 \quad +4$ $\quad$ $+4 \quad +4$

$(2)\ \frac{1}{2}x = 6\ (2)$ $\quad$ $(2)\ \frac{1}{2}x = 2\ (2)$

$\boxed{x = 12}$ $\quad$ $\boxed{x = 4}$

c) $\frac{3|-2x+3|}{3} = \frac{6}{3}$

$|-2x+3| = 2$

$-2x+3 = 2$ or $-2x+3 = -2$

$-3 \quad -3$ $\quad$ $-3 \quad -3$

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

$\boxed{x = 1/2}$ $\quad$ $\boxed{x = 5/2}$

D) $5|x-4| - 1 = 9$

$+1 \quad +1$

$\frac{5|x-4|}{5} = \frac{10}{5}$

$|x-4| = 2$

$x-4 = 2$ or $x-4 = -2$

$+4 \quad +4$ $\quad$ $+4 \quad +4$

$\boxed{x = 6}$ $\quad$ $\boxed{x = 2}$

E) $|3x+5| \leq 1$

$3x+5 \leq 1$ or $3x+5 \geq -1$

$-5 \quad -5$ $\quad$ $-5 \quad -5$

$\frac{3x}{3} \leq \frac{-4}{3}$ $\quad$ $\frac{3x}{3} \geq \frac{-6}{3}$

$\boxed{x \leq -4/3}$ $\quad$ $\boxed{x \geq -2}$

F) $|6-3x| > 6$

$6-3x > 6$ or $6-3x < -6$

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

$\frac{-3x}{-3} > \frac{0}{-3}$ $\quad$ $\frac{-3x}{-3} < \frac{-12}{-3}$

$\boxed{x < 0}$ $\quad$ $\boxed{x > 4}$

G) $\frac{3|2x-4|}{3} < \frac{9}{3}$

$|2x-4| < 3$

$2x-4 < 3$ $\quad$ $2x-4 > -3$

$+4 \quad +4$ $\quad$ $+4 \quad +4$

$\frac{2x}{2} < \frac{7}{2}$ $\quad$ $\frac{2x}{2} > \frac{1}{2}$

$x < 7/2$ $\quad$ $x > 1/2$

H) $2|6+2x|-4 \geq 8$

$+4 \quad +4$

$\frac{2|6+2x|}{2} \geq \frac{12}{2}$

$|6+2x| \geq 6$

$6+2x \geq 6$ $\quad$ $6+2x \leq -6$

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

$\frac{2x}{2} \geq \frac{0}{2}$ $\quad$ $\frac{2x}{2} \leq \frac{-12}{2}$

$x \geq 0$ $\quad$ $x \leq -6$

I) $5-2|x-3| = -3$

$-5 \quad -5$

$\frac{-2|x-3|}{-2} = \frac{-8}{-2}$

$|x-3| = 4$

$x-3 = 4$ $\quad$ $x-3 = -4$

$+3 \quad +3$ $\quad$ $+3 \quad +3$

$x = 7$ $\quad$ $x = -1$

J) $3+2|x+1| = 5$

$-3 \quad -3$

$\frac{2|x+1|}{2} = \frac{2}{2}$

$|x+1| = 1$

$x+1 = 1$ $\quad$ $x+1 = -1$

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

$x = 0$ $\quad$ $x = -2$

K) $2\frac{|x-5|}{2} < 3 \cdot 2$

$|x-5| < 6$

$x-5 < 6$ $\quad$ $x-5 > -6$

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

$x < 11$ $\quad$ $x > -1$

L) $6\frac{|x+2|}{6} \geq 1 \cdot 6$

$|x+2| \geq 6$

$x+2 \geq 6$ $\quad$ $x+2 \leq -6$

$-2 \quad -2$ $\quad$ $-2 \quad -2$

$x \geq 4$ $\quad$ $x \leq -8$

M) $\left|\frac{2x+7}{5}\right| \leq 3$

$(5)\ \frac{2x+7}{5} \leq 3\ (5)$

$2x+7 \leq 15$

$-7 \quad -7$

$\frac{2x}{2} \leq \frac{8}{2}$

$\boxed{x \leq 4}$

$(5)\ \frac{2x+7}{5} \geq -3\ (5)$

$2x+7 \geq -15$

$-7 \quad -7$

$\frac{2x}{2} \geq \frac{-22}{2}$

$\boxed{x \geq -11}$

N) $\left|\frac{4x-4}{3}\right| > 8$

$(3)\ \frac{4x-4}{3} > 8\ (3)$

$4x-4 > 24$

$+4 \quad +4$

$\frac{4x}{4} > \frac{28}{4}$

$\boxed{x > 7}$

$(3)\ \frac{4x-4}{3} < -8\ (3)$

$4x-4 < -24$

$+4 \quad +4$

$\frac{4x}{4} < \frac{-20}{4}$

$\boxed{x < -5}$