Serial #: _____ ID _____ NAME _____

Show all necessary steps for full marks.

Question 1: (5 points)(Textbook P.2 Exercise 32: Find the following

(a): $\dfrac{\dfrac{2}{3}}{\dfrac{2}{3}} - \dfrac{2}{2} = ?$ **(b):** $\dfrac{\dfrac{2}{5}+\dfrac{1}{2}}{\dfrac{1}{10}+\dfrac{3}{15}} = ?$

Solution:

32. (a) $\dfrac{\frac{2}{3}}{\frac{2}{3}} - \dfrac{\frac{2}{3}}{2} = 2 \cdot \frac{3}{2} - \frac{2}{3} \cdot \frac{1}{2} = 3 - \frac{1}{3} = \frac{9}{3} - \frac{1}{3} = \frac{8}{3}$

(b) $\dfrac{\frac{2}{5}+\frac{1}{2}}{\frac{1}{10}+\frac{3}{15}} = \dfrac{\frac{2}{5}+\frac{1}{2}}{\frac{1}{10}+\frac{1}{5}} = \dfrac{\frac{2}{5}+\frac{1}{2}}{\frac{1}{10}+\frac{1}{5}} \cdot \frac{10}{10} = \frac{4+5}{1+2} = \frac{9}{3} = 3$

Question 2: (5 points)(Textbook P.2 Exercises 45 and 46): If $A = \{x \mid x \geq -2\}$, $B = \{x \mid x < 4\}$ and $C = \{x \mid -1 < x \leq 5\}$, then find

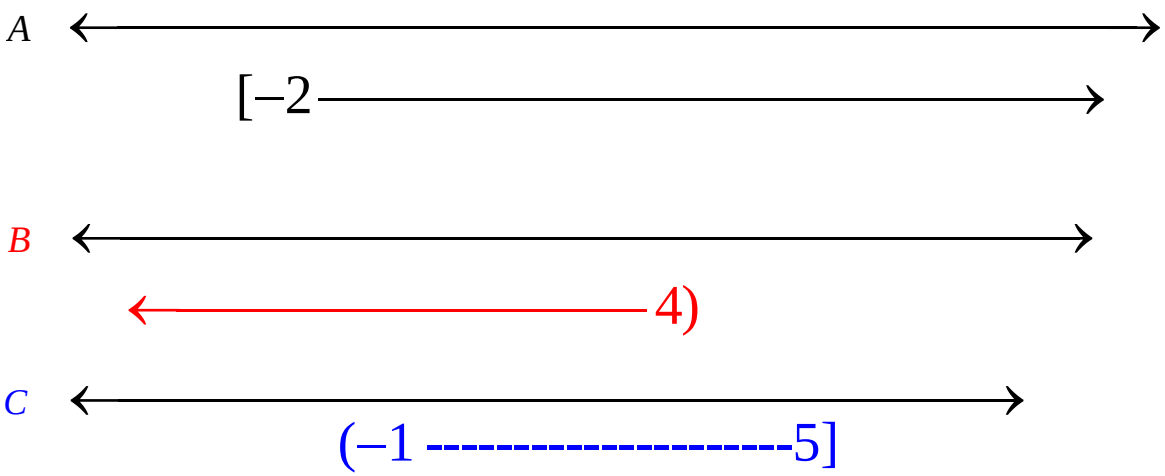
(a): $B \cup C = ?$

(b): $B \cap C = ?$

(c): $A \cup C = ?$

(a): $A \cap C = ?$

Solution:



(a) $B \cup C = \{x \mid x \leq 5\}$

(b) $B \cap C = \{x \mid -1 < x < 4\}$

(c) $A \cup C = \{x \mid x \geq -2\} = [-2, \infty) = A$

(d) $A \cap C = \{x \mid -1 < x \leq 5\} = (-1, 5]$

Question 3: (5 points): Find the value of the expression $-17+3\left[8x-4\left(3x-2\right)\right]$ when $x=-\frac{3}{4}$

Solution:

$$\begin{aligned}-17+3\left[8x-4\left(3x-2\right)\right] &= -17+3\left[8x-12x+8\right] \\ &= -17+3\left[-4x+8\right] \\ &= -17+3\left[(-4)\left(-\frac{3}{4}\right)+8\right] \\ &= -17+3\left[3+8\right] \\ &= -17+33 \\ &= 16\end{aligned}$$

Question 4: (5 points): If $-3<x<-1$, then write the expression $|3+x|+|2+2x|+\|-x\|$ without the absolute value symbols.

Solution: $x>-3 \Rightarrow x+3>0 \Rightarrow |x+3|=x+3$

$x<-1 \Rightarrow x+1<0 \Rightarrow 2+2x<0 \Rightarrow |2+2x|=-\left(|2+2x|\right)=-2-2x$

$\|-x\|=|x|=-x$

The expression $|3+x|+|2+2x|+\|-x\|=x+3-2-2x-x=1-2x$