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Group 3 CPE 3103

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Question 1

$x(t) =$

0	$t \leq 1$
$5-4t$	$1 < t \leq 2$
$2t-7$	$2 < t \leq 3$
$\frac{1}{2}t-2.5$	$3 < t \leq 5$
$t-6$	$5 < t \leq 6$
0	$t > 6$

$y+3 = -4(x-2)$
$y = -4x+5$
$x(t) = 5-4t$
$y+1 = 2(x-3)$
$y = 2x-7$
$x(t) = 2t-7$
$y-0 = \frac{1}{2}(x-5)$
$y = \frac{1}{2}x-2.5$
$x(t) = \frac{1}{2}t-2.5$
$y = x-6$
$x(t) = t-6$

Question 2 $x(s) = y(t)$ $t = -(1+2)$ $t = -(5+2)$ $t = -(6+2)$
$s = -t-2$ $t = 3$ $t = -7$ $t = -8$
$s+2 = -t$ $t = -(2+2)$ $t = -(3+2)$
$t = -(s+2)$ $t = -4$ $t = -5$

$y(t) =$

0	$t \leq -8$
$-t-8$	$-8 < t \leq -7$
$-\frac{1}{2}t-3.5$	$-7 < t \leq -5$
$-2t-11$	$-5 < t \leq -4$
$4t+13$	$-4 < t \leq -3$
0	$t > -3$

$-(t-2)-6$
$= -t-8$
$\frac{1}{2}(t-2)+2.5$
$= -\frac{1}{2}t-3.5$
$2(-t-2)-7$
$= -2t-11$
$5-4(-t-2)$
$= 4t+13$

Question 3 $(at+b)[u(t-t_1)-u(t-t_2)]$

1. $(-t-8)[u(t+8)-u(t+7)]$
2. $(-\frac{1}{2}t-3.5)[u(t+7)-u(t+5)]$ +
3. $(-2t-11)[u(t+5)-u(t+4)]$ +
4. $(4t+13)[u(t+4)-u(t+3)]$ +

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Question 4.

$$X(t) = \int_{-\infty}^{t} r(T)\,dT \qquad r(t) = ?$$

1. $0\,dT = \int r(T)\,dT\,dT$

$\boxed{r(t) = 0}$

2. $5 - 4\,t\,dT = \int r(T)\,dT\,dT$

$\boxed{r(t) = -4}$

3. $2t - 7\,dT = \int r(T)\,dT\,dT$

$\boxed{r(t) = 2}$

4. $\frac{1}{2}t - 2.5\,dT = \int r(T)\,dT\,dT$

$\boxed{r(t) = \frac{1}{2}}$

5. $t - 6\,dT = \int r(T)\,dT\,dT$

$\boxed{r(t) = 1}$

6. $0\,dT = \int r(T)\,dT\,dT$

$\boxed{r(t) = 0}$