

Problem 1

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(a)  $P[W \leq 4] = F_W(4) = \frac{1}{3} + \frac{3}{8}(4-3) = \frac{5}{8} = 0.625$  Ans

(b)  $P[-2 < W \leq 2] = F_W(2) - F_W(-2) = \frac{1}{4} - \frac{1}{4} = 0$  Ans ✓

(c)  $P[W > 0] = 1 - P[W \leq 0]$   
 $= 1 - F_W(0) = 1 - \frac{1}{4} = \frac{3}{4}$  Ans

(d)  $P[W \leq a] = \frac{1}{2}$

$F_W(a) = \left(\frac{1}{2}\right)$  ← This value is happen when  $3 \leq W \leq 5$

$\Rightarrow \frac{1}{4} + \frac{3}{8}(a-3) = \frac{1}{2}$  ;  $a = \frac{11}{3}$  Ans

Problem 2

a) pdf Properties.

$\int_{-\infty}^{\infty} f_x(x) dx = 1$

$= \int_0^{\infty} c x dx = \frac{1}{2} c x^2 \Big|_0^{\infty} = 1$  ;  $c = \frac{1}{2}$  Ans

(b)  $P[0 \leq X \leq 1] = \frac{1}{2} c x^2 \Big|_0^1 = \frac{1}{4} x^2 \Big|_0^1 = \frac{1}{4}$  Ans

(c)  $P[-\frac{1}{2} \leq X \leq \frac{1}{2}] = \frac{1}{2} c x^2 \Big|_0^{\frac{1}{2}} = \frac{1}{16}$  Ans

