HW 7_1

x	-4	-2	0	1	2	3
y	-10	3	8	25	52	36

(a) Linear Spline

for $-4 < x < -2$

$$y = y_0 + \frac{y_1 - y_0}{x_1 - x_0}(x - x_0)$$

$$y = -10 + \frac{3 - (-10)}{-2 - (-4)}(x - (-4))$$

$$= -10 + 6.5(x + 4)$$

$$= -10 + 6.5x + 26$$

$$= 6.5x + 16$$

for $-2 < x < 0$

$$y = 3 + \frac{8 - 3}{0 - (-2)}(x - (-2))$$

$$= 3 + 2.5(x + 2)$$

$$= 3 + 2.5x + 5$$

$$= 2.5x + 8$$

for $0 < x < 1$

$$y = 8 + \frac{25 - 8}{1 - 0}(x - 0)$$

$$y = 8 + 17(x)$$

$$y = 8 + 17x$$

Scanned with CamScanner

for $1 < x < 2$

$$y = 25 + \frac{52-25}{2-1}(x-1)$$

$$= 25 + 27(x-1)$$

$$= 25 + 27x - 27$$

$$= 27x - 2$$

$2 < x < 3$

$$y = 52 + \frac{36-52}{3-2}(x-2)$$

$$= 52 + (-16)(x-2)$$

$$= 52 - 16x + 32$$

$$= -16x + 84$$

(b) $x = -3.5, 0.8, 2.3$

at $x = -3.5$

$-4 < x < -2$

$y = 6.5x + 16 = 6.5(-3.5) + 16$

$y = -6.075$

at $x = 0.8$

$0 < x < 1$

$y = 17x + 8 = 17 \times 0.8 + 8$

$y = 21.6$

at $x = 2.3$

$2 < x < 3$

$y = -16x + 84 = -16 \times 2.3 + 84$

$y = 47.2$

Scanned with CamScanner