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a)

	Distance (km)	Rate (km/h)	Time (h)
Downstream	18	$x+3$	$\frac{18}{x+3}$
Upstream	8	$x-3$	$\frac{8}{x-3}$

b) $\frac{18}{x+3}=\frac{8}{x-3}$

c) $\frac{18}{x+3}=\frac{8}{x-3}$

$18(x-3)=8(x+3)$

$18x-54=8x+24$

$10x=78$

$x=7.8$

The rate of the kayakers in still water is 7.8 km/h.

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	Distance (km)	Speed (km/h)	Time (h)
To Forde Lake	70	$x-5$	$\frac{70}{x-5}$
Beyond Forde Lake	60	x	$\frac{60}{x}$

$$\frac{70}{x-5}-4(24)=\frac{60}{x}$$

$$70x-96x(x-5)=60(x-5)$$

$$70x-96x^2+480x=60x-300$$

$$0=96x^2-490x-300$$

$$0=48x^2-245x-150$$

$$x=\frac{-(-245)\pm\sqrt{(-245)^2-4(48)(-150)}}{2(48)}$$

$$x=\frac{245\pm\sqrt{88\,825}}{96}$$

$$x=5.6566...$$

The average speed of the herd beyond Forde Lake was 5.7 km/h, to the nearest tenth of a kilometre per hour.

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Let x kilometres per hour represent Ted's speed east of Swift Current.

	Distance (km)	Speed (km/h)	Time (h)
West of Swift Current	275	$x-10$	$\frac{275}{x-10}$
East of Swift Current	300	x	$\frac{300}{x}$

$$\frac{275}{x-10}=\frac{300}{x}+\frac{1}{2}$$
$$2(x)275=300(2)(x-10)+x(x-10)$$
$$550x=600x-6000+x^2-10x$$
$$0=x^2+40x-6000$$
$$0=(x+100)(x-60)$$
$$x=-100 \text{ or } x=60$$

Ted's average speed east of Swift Current was 60 km/h and west of Swift Current it was 50 km/h.

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Let x kilometres per hour represent the speed of the current.

	Distance (km)	Speed (km/h)	Time (h)
Up river	2	$6-x$	$\frac{2}{6-x}$
Down river	2	$6+x$	$\frac{2}{6+x}$

Use the fact that the total time to paddle up river and back is 1 h to write an equation.

$$\frac{2}{6-x}+\frac{2}{6+x}=1$$
$$2(6+x)+2(6-x)=(6+x)(6-x)$$
$$12+2x+12-2x=36-x^2$$
$$x^2=12$$
$$x=\sqrt{12}$$
$$x\approx 3.5$$

The speed of the current is approximately 3.5 km/h.