Chapter 8 Review

8.1 Systems of Linear Equations and Graphs

1. **a)** yes
b) no

2. **a)** approximately (3.48, −0.39)
b) approximately (−15.45, 7.05)

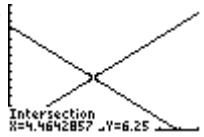
3. **a)** (2, 4)
b) $y = -2x + 8$ and $y = \frac{1}{2}x + 3$

4. **a)** The solution is (2, 55).
b) After 2 h, the second cyclist has caught up to the first cyclist at a distance of 55 km.

8.2 Modelling and Solving Linear Systems

5. **a)** $C = 0.50t$
$C = 25 + 0.25t$
b) $x + y = 23$
$0.10x + 0.25y = 3.35$
c) $d = 85t$
$d = 100(t - 1)$

6. **a)** Basic cost is the y-intercept of the graph. For DirectCar, this is \$60. For Wheels To Go, the basic cost is \$40. The slope of the graph represents the charge per kilometre of distance travelled. For DirectCar, the charge is \$0.50/km. For Wheels To Go, the charge is \$0.75/km.
b) Wheels To Go
c) Choose DirectCar when $d > 80$ km.
d) Charges are equal (a total of \$100) at 80 km. Choose Wheels To Go when $d < 80$ km and choose DirectCar when $d > 80$ km.

7. **a)** $V = 12.5 - 1.4t$
$V = 1.4t$
b) 

c) The point of intersection is approximately (4.46, 6.25). After about 4.46 min, the truck and the bin both have 6.25 m^3 of grain in them.

8. **a)** $A = 885 - 35t$
$A = 1450 - 60t$
b) The solution is (22.6, 94).
c) After 22.6 s, both files have 94 MB left to download.

8.3 Number of Solutions for Systems of Linear Equations

9. **a)** $x + y = 45$
$x = 3y - 15$
b) Bill is 30. Nancy is 15.

10. **a)** no solution; lines have same slope but different y-intercepts so they are parallel
b) an infinite number of solutions; second equation is a multiple of the first
c) one solution; lines have different slopes and therefore must intersect at one point

11. no solution

12. a) P and R, P and S, P and Q, Q and R, and Q and S

b) R and S

13. a) $p + d = 24$ and $2p + 4d = 82$

b) solution is (7, 17), i.e., 7 parrots and 17 dogs

c) With 83 legs, the solution would not be a whole number of normal parrots or dogs.

d) Even though the slopes of the lines are different and the lines intersect, the domain and range are N, not R.