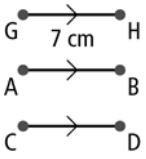
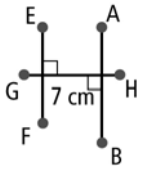
Chapter 3 *MathLinks 7*
Student Resource Answers

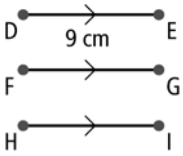
3.1 Parallel and Perpendicular Line Segments, pages 87–88

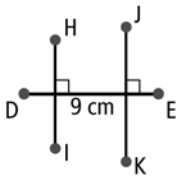
5. Parallel: CD and EF; EF and GH; CD and GH
Perpendicular: AB and CD; AB and EF; AB and GH; AH and GH; AH and CD; AH and EF

6. Parallel: Main and North; Major and Centre
Perpendicular: Main and Major; Main and Centre; North and Major; North and Centre

7. a) 

b) 

8. a) 

b) 

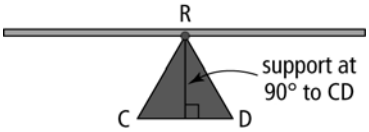
9. Parallel. Answers may vary. A biplane has two sets of wings, which are the same distance apart at any two points.

10. Yes. Measure the distance between each pair of lines at either end with a ruler.

11. Answers may vary.
a) lines painted in the middle of a road; railroad tracks **b)** side and bottom of a box; window frame
c) playing card; table

12. Check that only parallel and perpendicular line segments have been used.

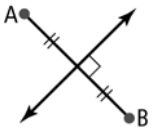
13. Answers may vary. From each end of the existing shelf, measure and mark an equal distance away. Connect the marks with a line.

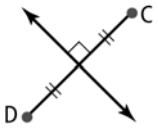
14. 

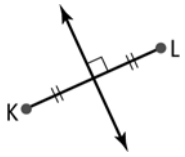
15. 

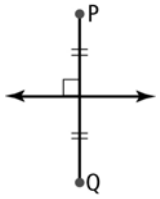
16. a) Answers may vary. Angles 1, 4, 5, and 8 are equal, and angles 2, 3, 6, and 7 are equal. **b)** There are only two different sizes of angles.

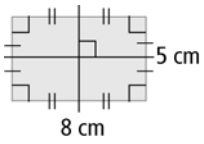
3.2 Draw Perpendicular Bisectors, pages 92–93

4. a) 

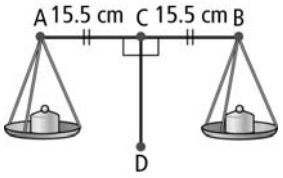
b) 

5. a) 

b) 

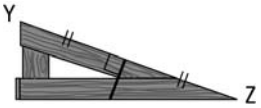
6. a) 

b) The lines intersect at the centre of the rectangle.

7. 

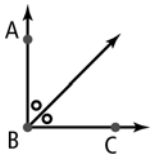
8. Answers may vary. **i)** Measure AD. Extend AD to point B so that AD = DB. **ii)** Make your compass opening equal AD. With your compass point at D, draw an arc equal in length to AD. To draw DB, extend AD until it intersects the arc.

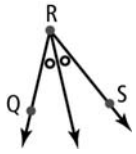
9. Cut a support post that is 1.4 m high. To find the halfway point of the top horizontal pole, divide the length of 3 m in half to get 1.5 m. Place the support at this halfway point. Measure a right angle where the top pole and the support meet in order to position the support perpendicular to the top pole.

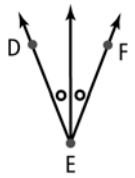
10. 

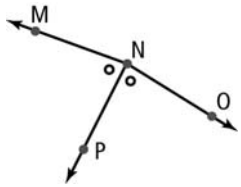
Answers may vary slightly. 0.25 m

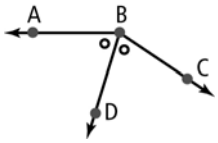
3.3 Draw Angle Bisectors, pages 98–99

6. a) 

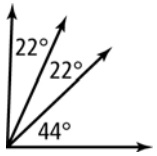
b) 

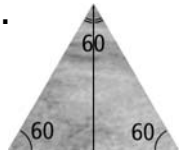
7. a) 

b) 

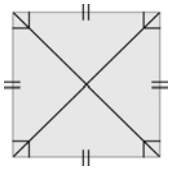
8. a) 

b) Answers may vary.
c) ∠ABD = 73°; ∠CBD = 73°

9. 

10. 

Methods used may vary.

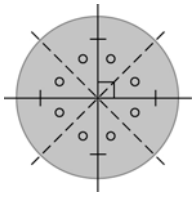
11. a), b) 

c) Answers may vary. The bisectors meet in the centre of the square and the resulting angles are all equal.

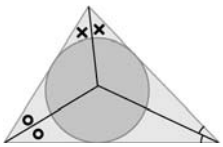
12. The triangle is an equilateral or an isosceles triangle because at least two angles are equal. If the parents bisect the angle in the river, they will divide the land into two equal pieces.

13. 

Answers may vary slightly. 0.5 m.

14. 

Draw a line that divides the circle in half and draw the perpendicular bisector of that line. Then draw the angle bisector of the four resulting right angles.

15. 

a) They meet inside the triangle.
b) The circle touches all three sides.

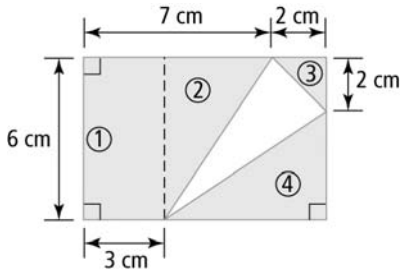
3.4 Area of a Parallelogram, pages 105–107

3. a) 3 cm^2 **b)** 6 cm^2
4. a) 4 cm^2 **b)** 9 cm^2
5. a) 20 cm^2 **b)** 21 cm^2
6. a) 24 cm^2 **b)** 8 cm^2
7. a) 55 cm^2 **b)** 63 cm^2 **c)** 18.6 m^2
8. a) 27 m^2 **b)** 113.16 mm^2 **c)** 40.5 cm^2
9. 4 m **10.** 6 m
11. a) Answers may vary. b = 2 cm, h = 1.5 cm. Measure the base using a ruler. Use a protractor to draw the height perpendicular to the base and measure the height using a ruler.
b) 3 cm^2 **c)** The answer is the same.
12. They are equal in area. The base and height of the two shapes are the same.
13. 2 m **14.** 10 cm^2 **15.** 28 units^2
16. 10.8 cm^2 **17.** 27 000 m^2
18. a) 95 m^2 **b)** 50 × 100 = $5000 **c)** $5225
19. 9.6 cm
20. Answers may vary. 16.05 cm^2
Divide the X into 3 sections. Use a ruler to measure the base and height of parallelogram 1, parallelogram 2, and parallelogram 3. Calculate the area of each. The area of the X is area 1 + area 2 – area 3.

3.5 Area of a Triangle, pages 113–115

4. a) 3 cm^2 **b)** 2 cm^2 **5. a)** 6 cm^2 **b)** 4 cm^2
6. a) 21 cm^2 **b)** 10 cm^2
7. a) 8 cm^2 **b)** 7.5 cm^2
8. a) 27 mm^2 **b)** 40 cm^2 **c)** 86.14 mm^2
9. a) 14.4 m^2 **b)** 19.36 cm^2
c) 0.54 m^2 or 5400 cm^2
10. 78 daffodils **11.** 4 bags
12. Answers may vary. **a)** b = 3.5 cm, h = 2 cm **b)** Measure the height and base at right angles with a ruler. **c)** 3.5 cm^2
13. Answers may vary.
a) b = 3.5 cm, h = 1.2 cm. Measure the base using a ruler. Use a protractor to draw the height perpendicular to the base and measure the height using a ruler.
b) 2.1 cm^2 **c)** It is the same.
14. a) 269.15 m^2 **b)** Yes. Answers may vary. You will need additional material for the seams and attachments.
15. 0.3 m^2
16. No, they do not have the same perimeter.
17. 26.28 cm^2
18. Emily is correct. Answers may vary. When a triangle and parallelogram have the same base and the same height, the area of the triangle is 50% of the area of a parallelogram. This triangle has half the height of the parallelogram, so it has 25% of the area of the parallelogram.

19. Fahad is correct. Answers may vary. For example,



Area of white triangle
= Area of rectangle – (area1 + area2 + area3 + area4)

$= (9 \times 6) - (3 \times 6 + \frac{4 \times 6}{2} + \frac{2 \times 2}{2} + \frac{6 \times 4}{2})$

$= 54 - (18 + 12 + 2 + 12)$

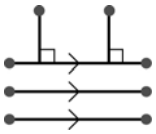
$= 10 \text{ cm}^2$

Chapter 3 Review, pages 116–117

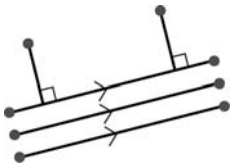
1. D **2.** E **3.** F **4.** B **5.** C

6. a) parallel **b)** neither **c)** perpendicular **d)** neither

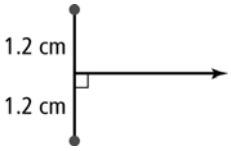
7. a)



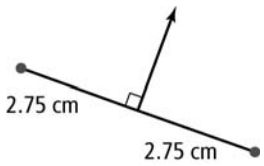
b)



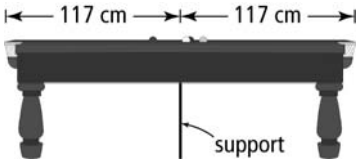
8. a)



b)



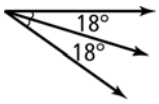
9.



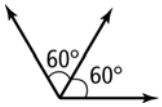
10. a) 7.5 cm

b) $\frac{1}{4}$ of the original line segment

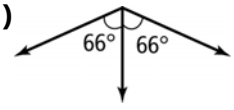
11. a)



b)



12. a) Answers may vary. 66° **b)**



13. a) 20° **b)** $\frac{1}{4}$ of the original angle

14. a) 15 m^2 **b)** 19.98 mm^2

15. The area of the rectangle is 2.7 times the area of the parallelogram. The only difference is the length of the base. The height is the same.

16. a) 6 m^2 **b)** 13.78 m^2

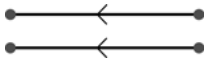
17. a) 0.88 km^2

b) The creek is not in a straight line.

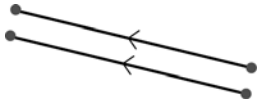
Chapter 3 Practice Test, pages 118–119

1. A **2.** D **3.** B **4.** B **5.** B

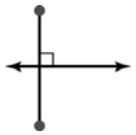
6. a)



b)

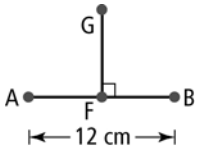


7. a)



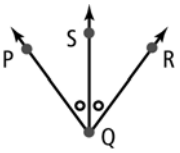
b)

8. a)



b) 6 cm **c)** 90°

9. a)



b) 36°

10. 1.5 cm^2 **11.** 16 units^2

12. a) b = 13 m; h = 6.5 m

b) 13 m^2 **c)** 13 m^2

13. h = 14 cm, A = 168 cm^2

14. a) 6.75 m^2 **b)** 58.315 m^2