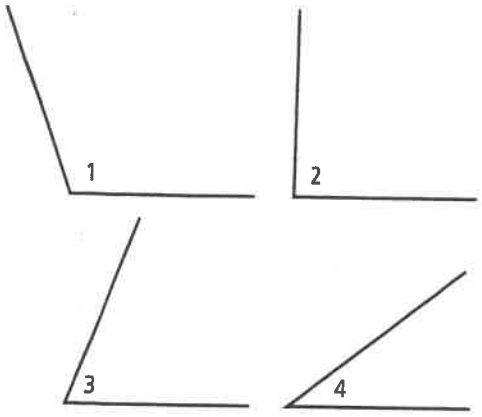
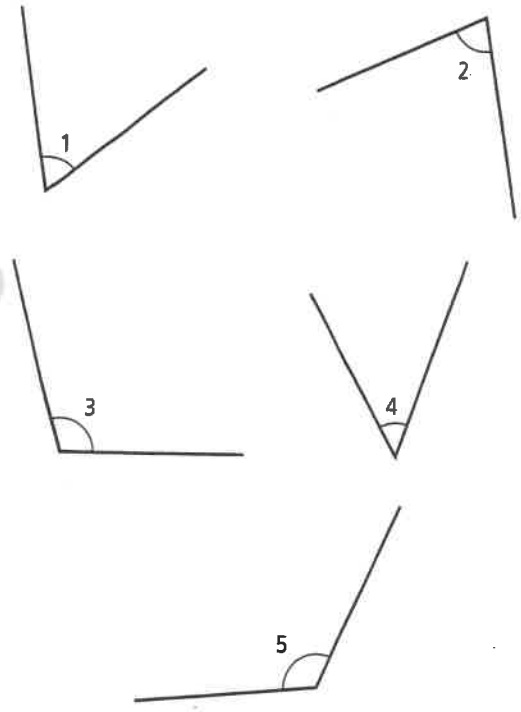
Get Ready

Angle Measures

1. Which angle has a measure of about 75°?



2. Estimate and then use a protractor to measure each angle.



3. Draw an angle that you estimate has the given measure. Then, measure each of your angles with a protractor to see how close your estimate is to the actual measure.

a) 30°

b) 65°

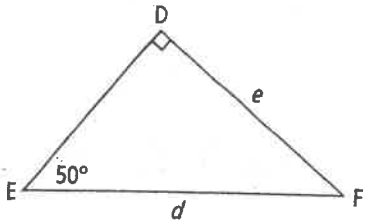
c) 90°

d) 130°

Drawing Triangles

4. Sketch $\triangle EFG$ with $\angle E = 90°$ and $\angle F = 40°$. Do not use a protractor. Label your sketch.

5. Consider $\triangle DEF$ with $\angle D = 90°$ and $\angle E = 50°$:



a) Name side DE another way.

b) What is the size of $\angle F$?

c) What is the shortest side of $\triangle DEF$?

d) Name $\angle F$ another way.

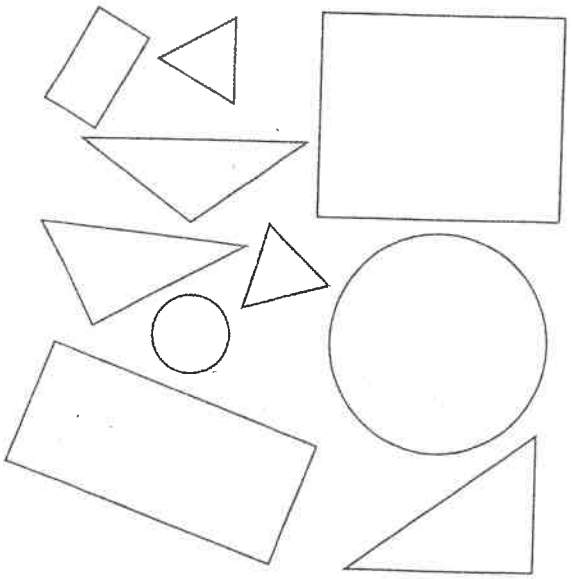
6. Right triangle PQR has the following properties:

- an angle of 30°
- the shortest side is labelled PQ

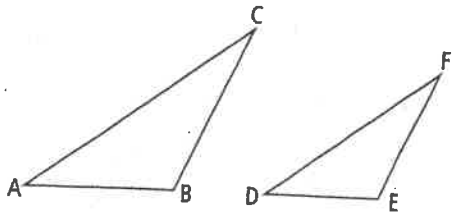
How many ways could you sketch and label the triangle? Explain.

Similar Figures

7. Sort the following figures into sets so that all the figures in each set are similar. Explain your thinking.



8. $\triangle ABC$ is similar to $\triangle DEF$.

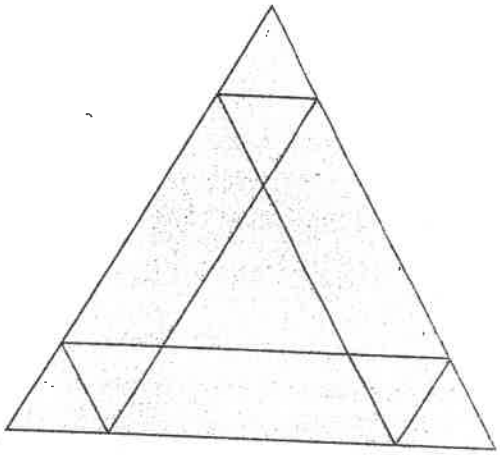


a) Show how the angles of the two triangles are related.

b) Which sides of the triangles are proportional? Explain what this means.

c) Replace x in the proportion to make a true statement: $\frac{AB}{DE} = \frac{x}{DF}$.

9. a) How many triangles are in the figure?



b) How many different triangles are in the figure?

Proportional Reasoning

10. Solve for each unknown quantity without using a calculator.

a) $\frac{x}{9} = \frac{2}{3}$

b) $\frac{6}{x} = \frac{8}{3}$

c) $\frac{7}{9} = \frac{-4}{x}$

d) $\frac{3}{y} = \frac{6}{y+1}$

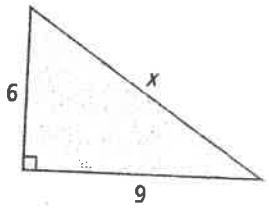
11. If Simon can read 60 pages of a book in 25 min, how long will it take him to read a 240-page book?

12. A loonie has a diameter of 26.5 mm. How long is a line of 5000 loonies?

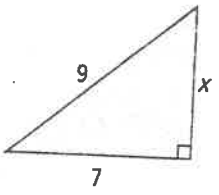
Pythagorean Theorem

13. For each right triangle, write a mathematical equation that demonstrates the Pythagorean relationship. Do not solve the equation.

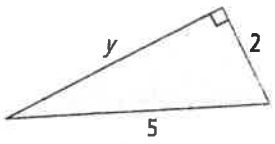
a)



b)



c)



14. Solve for x.

a) $x^2 = 3^2 + 4^2$

b) $x^2 = 8^2 + 6^2$

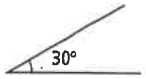
c) $169 = x^2 + 25$

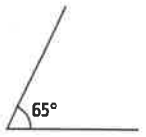
d) $289 = 64 + x^2$

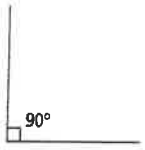
Chapter 2

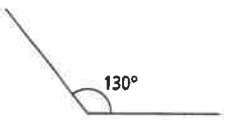
Get Ready, pages 44 to 45

1. ∠3
2. ∠1 = 60°, ∠2 = 75°; estimates may vary. Actual: ∠3 = 105°, ∠4 = 50°, ∠5 = 120°
3. Estimates may vary. Actual:

a) 

b) 

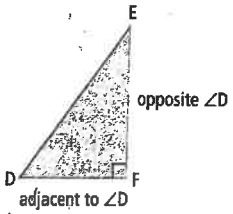
c) 

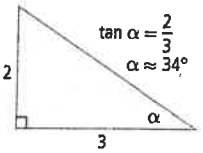
d) 

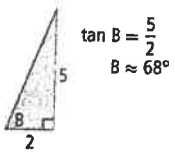
4. 

5. a) side f b) 40°
   c) side f d) ∠EFD or ∠DFE
6. The triangle could be sketched in two ways. The shortest side, PQ, is opposite the smallest angle. As a result, the 30° angle is labelled R in both sketches. However, side PQ could be labelled with either the P or the Q at the right angle.
7. Sets can be arranged in several ways. Possible explanations include
   • arranging by shape (circles, rectangles, and triangles)
   • arranging by size (small and large)
   • arranging by orientation (horizontal/vertical and rotated)
   • arranging as "similar figures" mathematically (two circles, two right triangles, two equilateral triangles, or two rectangles where the length is slightly more than twice the width)
8. a) ∠A = ∠D, ∠B = ∠E, and ∠C = ∠F
   b) $\frac{AB}{DE} = \frac{AC}{DF} = \frac{BC}{EF}$
   c) $x = AC$
9. a) 14 b) 5
10. a) $x = 6$ b) $x = \frac{9}{4}$
    c) $x = -\frac{36}{7}$ d) $x = -\frac{1}{3}$
11. 100 min
12. 132.5 m
13. a) $x^2 = 6^2 + 9^2$
    b) $x^2 = 9^2 - 7^2$ or $9^2 = x^2 + 7^2$
    c) $y^2 = 5^2 - 2^2$ or $5^2 = y^2 + 2^2$
14. a) $x = 5$ b) $x = 10$
    c) $x = 12$ d) $x = 15$

2.1 The Tangent Ratio, pages 53 to 59

1. a) hypotenuse: XZ; opposite: ZY; adjacent: XY
   b) hypotenuse: ST; opposite: SR; adjacent: RT
   c) hypotenuse: LM; opposite: MN; adjacent: LN
2. a) 

   b) $\tan D = \frac{EF}{DF}$
3. a) 3.4874 b) 1 c) 1.7321
   d) 57.2900 e) 0.7536 f) 0.3249
4. a) 35° b) 60° c) 29°
   d) 49°
5. a) 

   b) 

6. a) 11.0 b) 6.0
   c) 5.1 d) 13.1
7. a) 54.0° b) 51.3°
   c) 32.0° d) 36.9°
8. a) $x \approx 19.8$ m b) $\theta \approx 3.6°$
9. a) 45° b) 5 m
10. approximately 42.1° and 47.9°
11. a) 866 cm
    b) The ratio 1:12 is the tangent of the angle of the ramp. For a safe ramp, the angle of the ramp must be less than or equal to 4.8°. The ramp shown is not safe.
12. approximately 0.5°
14. 1592 feet
15. a) approximately 35° b) approximately 79 m
16. a) approximately 216.3 m
    b) approximately 741.6 m
17. a) approximately 1.83 m
    b) approximately 5.02 m
18. a) 49.3 m b) 50.0 m
20. Example: Ratio: A ratio is the quotient of one number over another. The tangent ratio is the quotient of the length of the side opposite the reference angle over to the length of the side (that is not the hypotenuse) adjacent to the reference angle.
    $\theta = 63°$: The symbol θ is generally used to indicate the size of an angle. If $\theta = 63°$, the ratio