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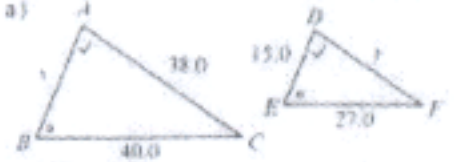
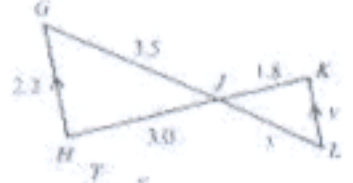
Review exercises – Similar & Right Triangles

1. Explain why the triangles are similar and then find the values of x and y.

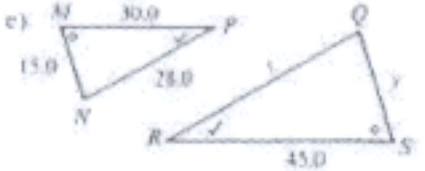
a)



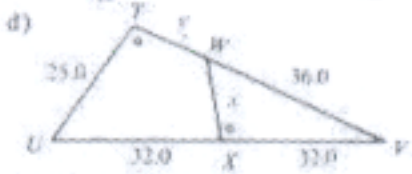
b)



c)



d)

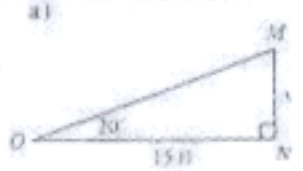


2. a) The moon is approximately 385 000 km away. When a ruler is held 56 cm from the eye, the diameter of the moon appears to be 0.5 cm. What is the diameter of the moon?
   b) During a total eclipse, the sun and moon seem to be the same size. If the sun is 150 000 000 km away, what is its diameter?

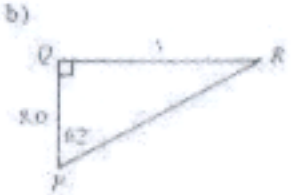
3. Find
   a) $\tan 27°$ b) $\tan 38°$ c) $\tan 65°$ d) $\tan 81°$

4. Find $\angle A$.
   a) $\tan A = 1.4$ b) $\tan A = \frac{7}{4}$ c) $\tan A = 0.065$ d) $\tan A = \frac{20}{7}$

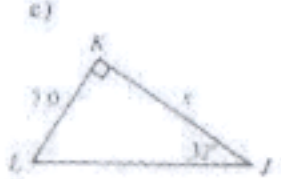
5. Find the value of x.
   a)



   b)



   c)



6. In $\triangle ABC$, find $\angle B$ if AC is a) 6 b) 12 c) 15

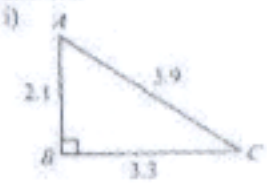
7. A rectangle measures 8 cm by 4 cm. Find the measures of the two acute angles formed at a vertex by a diagonal.

8. A guy wire fastened 50 m from the base of a television tower makes an angle of 55° with the ground. How high up the tower does the guy wire reach?

9. Find
   a) $\sin 37°$ b) $\cos 66°$ c) $\cos 28°$ d) $\sin 55°$

10. Find $\angle A$.
    a) $\cos A = 0.372$ b) $\sin A = 0.590$ c) $\sin A = 0.805$ d) $\cos A = 0.070$

11. a) In each triangle, calculate $\sin A$ and $\cos A$.
    b) Find $\angle A$.
    i)



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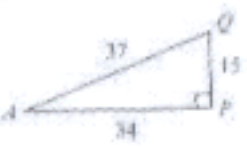
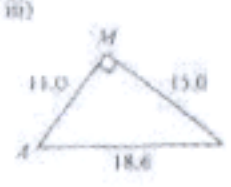
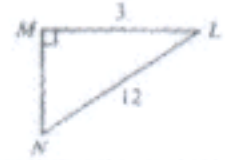


    iii)

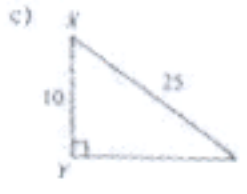


12. Determine the measures of the acute angles.
    a)

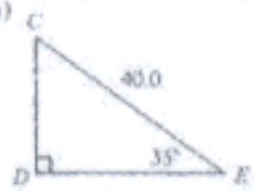


    b)

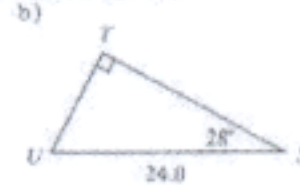
    c)



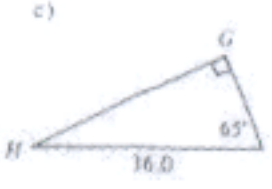
13. Determine the lengths of the sides not given.
    a)



    b)



    c)



14. In $\triangle ABC$, $\angle C = 90°$ and $AC = 8.0$. Find AB and BC if
    a) $\angle A = 28°$ b) $\angle A = 54°$ c) $\angle B = 48°$

15. From a distance of 60 m at ground level, the angle of elevation of the top of a flagpole is 32°. Determine the height of the flagpole to the nearest tenth of a metre.

16. When the foot of a ladder is 1.8 m from a wall, the angle formed by the ladder and the ground is 72°.
    a) How long is the ladder?
    b) How high up the wall does the ladder reach?

17. A tree casts a shadow 40 m long when the sun's rays are at an angle of 36° to the ground. How tall is the tree?

18. From the top of a building 70 m high, the angle of depression of an automobile on a road is 27°. How far is the automobile from the foot of the building?

19. A broadcasting tower is 255 m high. How far from the base of the tower is a surveyor who observes that the angle of elevation of the top of the tower is 38°?

20. Two office towers are 30 m apart. From the 15th floor (40 m up) of the shorter tower, the angle of elevation of the top of the other tower is 30°. Find the
    a) angle of depression of the base of the taller tower from the 15th floor
    b) height of the taller tower

Solutions...

1.a) $x = 22.2$, $y = 25.7$ b) $x = 2.1$, $y = 1.3$ c) $x = 42.0$, $y = 22.5$ d) $x = 14.1$, $y = 20.9$ 2.a) about 3400 km b) about 1 340 000 km 3.a) 0.510 b) 0.781 c) 2.145 d) 6.314 4.a) 55° b) 60° c) 4° d) 71° 5.a) 5.5 b) 15.0 c) 11.2 6.a) 31° b) 50° c) 56° 7.27°, 63° 8.71.4 m

9.a) 0.602 b) 0.407 c) 0.883 d) 0.819 10.a) 68° b) 36° c) 54° d) 86° 11.a) 0.846, 0.538 ii) 0.405, 0.919 iii) 0.806, 0.591 b) 58° ii) 24° iii) 54° 12.a) 14°, 76° b) 57°, 37° c) 24°, 66° 13.a) 23.0, 32.8 b) 11.3, 21.2 c) 15.2, 32.6 14.a) $AB = 9.1$, $BC = 4.3$ b) $AB = 13.6$, $BC = 11.0$ c) $AB = 10.8$, $BC = 7.2$ 15. 37.5 m 16.a) 5.8 m b) 5.5 m 17. 29 m 18. 137.4 m 19. 327 m 20.a) 57° b) 122.4 m