3. ABC is a triangle in which D divides $[BC]$ in the ratio $2:3$. If E divides $[CA]$ in the ratio $5:4$, find the ratio in which $[BE]$ divides $[AD]$. (2 points)
4. P, Q and R lie on sides $[AB], [BC]$ and $[CA]$ of triangle ABC. If $AP = 2/3AB, BQ = 3/4BC$ and $CR = 1/7CA$, prove that $[AB], [BC]$ and $[CA]$ are concurrent. (2 points)

Exercise 16. *$ABCD$ is a cyclic quadrilateral with $AB = 4cm, BC = 5cm, DA = 6cm, \angle BCD = 88°, \angle DAB = 92°$. Find the length of CD and the length of diagonal BD. (2 points)*

Exercise 6. *A circle of radius length $\sqrt{20}$ contains the point $(0, 2)$, its centre lies on the line $x + 2y = 0$. Find the equations of the circles that satisfy these conditions.* (2 points)

Exercise 7. *Solve the following triangles (i.e. find all sides and angles).* (2 points)
(i) $b = 17.6, C = 48.25°, c = 15.3,$
(ii) $B = 129°, b = 7.89, c = 4.56,$
(iii) $A = 28.25°, a = 8.5, b = 14.8.$

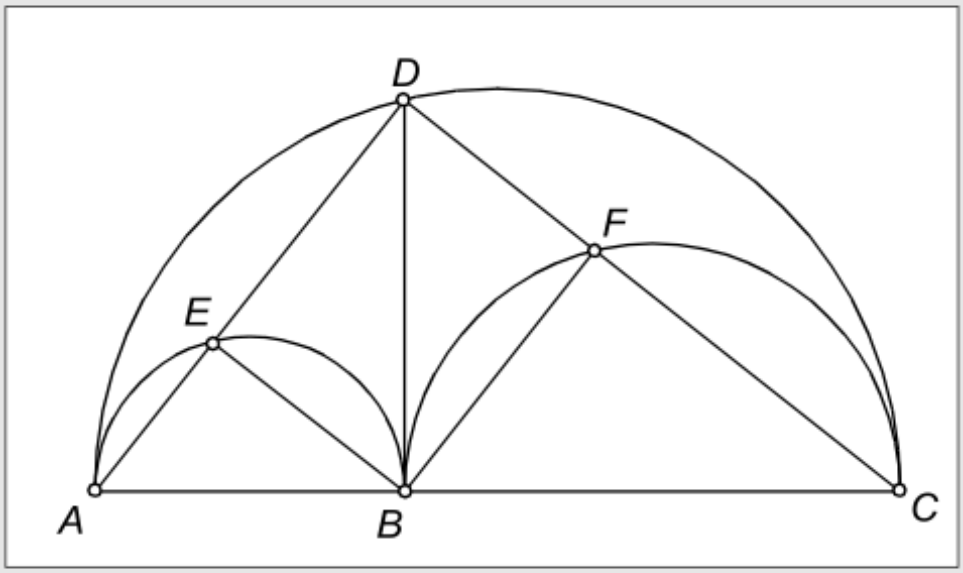
Exercise 11. *Show that the parametric equations*

$$x = \frac{1}{1+4t^2}, \qquad y = \frac{2t}{1+4t^2}, t \in \mathbb{R}$$

represent a circle and find its centre and radius length. (2 points)

Exercise 5. (2 points)

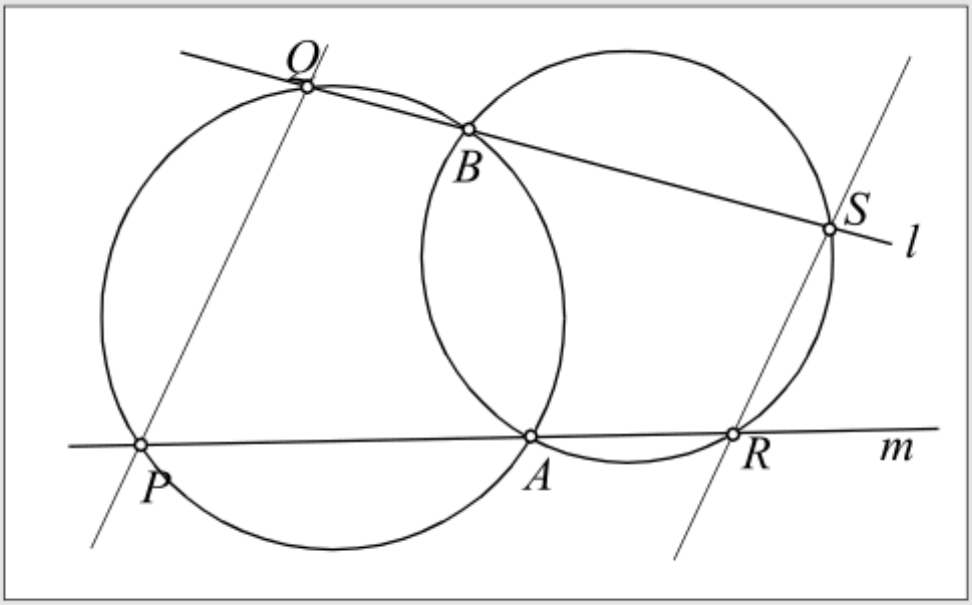
In this figure three half circles are shown. The diameters of the small circles make up the diameter of the large one. *BD* is the common tangent line of the small half circles.



You need to prove: *DEBF is a rectangle.*

Exercise 2.
(2 points)

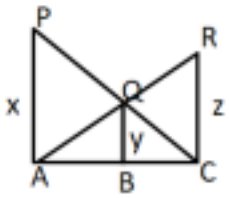
Here two circles are given and two lines l and m, which go through the intersections A and B of the circles.



To prove: PQ // RS.

Exercise 1.
(2 points)

In fig. PA, QB,RC are each perpendicular to AC prove that $\frac{1}{x}+\frac{1}{z}=\frac{1}{y}$



Exercise 8.
(1 point)

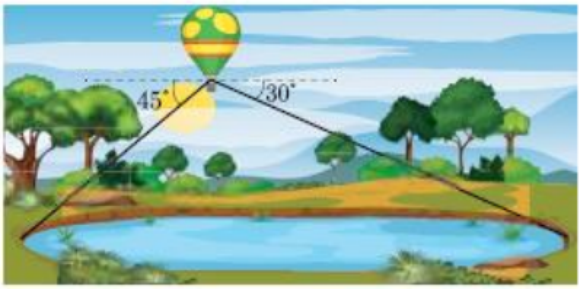
In what ratio is the line segment joining the points A (-2, -3) and B(3,7) divided by the y-axis? Also, find the coordinates of the point of division

Exercise 9.
(2 points)

Points A (-1 ,y) and B(5, 7) lie on a circle with centre O (2 , -3y). Find the values of y. Hence, find the radius of the circle.

Exercise 10.
(2 points)

Observe the figure given below The angle of depression to one side of a lake, measured from a balloon 300 meter above the lake as shown in the accompanying figure, is 45^0 . The angle of depression to the opposite side of the lake is 30^0.



Find the width of the lake.

Exercise 12.
(2 points)

Write the equation of each line:

(a) parallel to the x-axis and through $P = (-1, 2)$
(b) parallel to $y = -x - 1$ with x-intercept 3
(c) parallel to $4x - 4y = 5$ and through $P = (-1, 2)$
(d) perpendicular to $y = \frac{1}{4}x - 2$ with the same x-intercept as $3x - 5y = 30$
(e) perpendicular to $3x - 6y = 10$ with the same y-intercept as $-x + y = 5$
(f) gradient -2, passing through $(-2, 1)$.

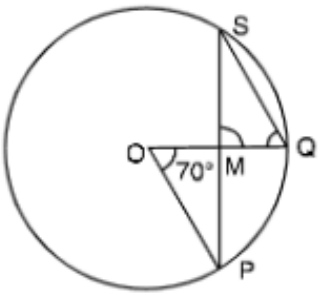
Exercise 13.
(1 point)

Find the x- and y-intercepts of each linear function.

(a) $2x - 5y = 20$
(b) $4x + 3y = 24$.

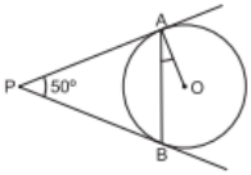
Exercise 14.
(1 point)

O is the centre of a circle, $\angle POQ = 70°$ and $PS \perp OQ$. Find $\angle MQS$.



Exercise 15.
(1 point)

In the given figure, PA and PB are two tangents to the circle with centre O. If ∠APB = 50 then what is the measure of ∠OAB.



Exercise 17.
(2 points)

In the given figure, ABC is a right-angled triangle with AB = 6 cm and AC = 8 cm. A circle with centre O has been inscribed inside the triangle. Calculate the value of r, the radius of the inscribed circle.