

Answers are at the end of the test

1. Determine the equation of the line that is perpendicular to the line $y = -\frac{3}{4}x - 7$ that passes through (5, -6).
2. Determine the equation of the line passing through A (-5, 11) and B (7, 8).
3. Determine the midpoint of $A\left(\frac{5}{4}, 6\right)$ and $B\left(-\frac{3}{2}, 9\right)$.
4. The line segment AB has endpoint A (-5, 4) and midpoint M at (1, 1). Determine the coordinates of the point B.
5. Determine the length of the line segment with end points at P (-4, -7) and Q (5, 3).
6. Determine the length of the line segment with end points at C (1.3, 5.7) and D (5.9, 9.2). Give your answer correct to 2 decimal places.
7. Determine whether the triangle with vertices D (-5, 1), E (-3, -5) and C (1, -1) is isosceles.
8. Determine the shortest distance from (-2, 5) to the line $y = \frac{3}{4}x + 3$.
9. $\triangle ABC$ has vertices A (1, 3), B (5, 9) and C (9, 7). Determine the equation of the altitude from B.
10. $\triangle DEF$ has vertices D (1, -1), E (7, -3) and F (2, -9). Determine the equation of the median from F.
11. $\triangle ABC$ has vertices A (-4, -7), B (0, 1) and C (2, -5). Determine the slopes and lengths of the sides. Using this information, classify the triangle.
12. $\triangle OCD$ has coordinates O (0, 0), C (3, 3) and D (6, 0).
 - a. Determine the equations of the right bisectors of the sides algebraically.
 - b. Determine the coordinates of the circumcentre.
13. Quadrilateral PQRS has vertices P (-3, 2), Q (0, 3), R (3, -1), and S (-6, -4). Verify that this quadrilateral is a trapezoid.

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14. A rhombus UVWX has vertices U (-6, 3), V (-2, 4), W (-3, 0) and X (-7, -1). Verify that the quadrilateral formed by joining the midpoints of the sides is a rectangle.
15. A circle passes through the point (1, 7). Determine the equation of the circle.
16. Verify that the point (-7, -3) lies on the circle $x^2 + y^2 = 58$
17. Determine the centre of the circle that passes through X (-5, 4), Y (-3, 8), and Z (1, 6)
18. Determine the length of the radius for the circle in question #17.
19. A circle centred at the origin passes through A (-4, 2) and B (2, 4). Determine the equation of the perpendicular bisector of the chord AB and show that it passes through the origin.
20. A circle has equation $x^2 + y^2 = 41$ and passes through the point P (5, 4). Determine the equation of the tangent line at this point

Answers

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| 1. $4x - 3y - 38 = 0$ | 8. 2.8 units | 15. $x^2 + y^2 = 50$ |
| 2. $x + 4y - 39 = 0$ | 9. $2x + y - 19 = 0$ | 16. show LS = RS |
| 3. $\left(-\frac{1}{8}, \frac{15}{2}\right)$ | 10. $7x + 2y - 32 = 0$ | 17. (-2, 5) |
| 4. (7, -2) | 11. $AC = BC = \sqrt{40}$, $AB = \sqrt{80}$
$m_{BC} = -3, m_{AC} = \frac{1}{3}, m_{AB} = -1$
Isosceles Right Triangle | 18. $\sqrt{10}$ |
| 5. 13.45 units | 12. a) OC OC $y = -x + 3$, CD $y = x - 3$, OD $x = 3$
b) (3, 0) | 19. $y = -3x$ |
| 6. 5.78 units | 13. $m_{PQ} = m_{RS} = \frac{1}{3}$ $PQ = \sqrt{10}$, $RS = \sqrt{90}$ | 20. $y = \frac{5}{4}x + \frac{41}{4}$ |
| 7. $DE = DC = \sqrt{40}$, $EC = \sqrt{32}$ | 14. show opposite sides are equal and adjacent perpendicular. | |