

SET 2: Applied Mathematics

Tutorial 1

1. Find the distance between $A(-1.2, -3.6)$ and $B(-11.3, -8.9)$. [Ans. 11.41]
2. Find the midpoint between $R(-3.5, 5.9)$ and $S(8.7, -3.6)$. [Ans. $M(2.6, 1.15)$]
3. $M(-2.2, 1.5)$ is the midpoint between $J(9.3, -8.4)$ and $K(x, y)$. Find x and y . [Ans. $x = -13.7$ and $y = 11.4$]
4. Find the slope of the line that contains the points $P(4.3, -4.7)$ and $T(-7.1, -6.5)$. [Ans. 0.158]
5. Find the slope of the line that contains the points $C(-7.5, 1.2)$ and $D(-7.5, -9.6)$. [Ans. undefined]
6. Line f is parallel to line g and the slope of line g is $\frac{2}{7}$. Find the slope of line f . [Ans. $\frac{2}{7}$]
7. Lines a and b are perpendicular. If the slope of line a is -0.25 , find the slope of line b . [Ans. 4]
8. Determine whether the lines h and k are parallel, perpendicular or neither if the slope of line h is -0.125 and the slope of line k is 8. [Ans. perpendicular]
9. Find the slope and the y -intercept of the line $x - 5y + 10 = 0$. [Ans. $m = \frac{1}{5}$, $b = 2$]
10. Determine whether the lines $3x - 5y = 12$ and $-6x + 10y = -6$ are parallel, perpendicular or neither.
[Ans. parallel]
11. If points $A(1.7, y)$ and $B(x, -3.1)$ lie on the graph of $y = -2x + 12$, find x and y . [Ans. $x = 7.55$ and $y = 8.6$]
12. Find the equation of the line that contains the points $S(3, -11)$ and $T(-7, -5)$. Write the equation in the point-slope form and the standard form. [Ans. $y + 11 = -\frac{3}{5}(x - 3)$ or $y + 5 = -\frac{3}{5}(x + 7)$, $3x + 5y = -46$]
13. Find the equation of the line that contains $P(3, -11)$ and is parallel to the line $4x - 8y = 15$ and write it in the standard form. [Ans. $x - 2y = 25$]
14. Find the equation of the line which passes through $F(-1, 5)$ and is perpendicular $15x - 5y = -6$ and write it in the standard form. [Ans. $x + 3y = 14$]
15. Find the equation of the line containing point $D(-1, 5)$ and is perpendicular to $y = -12$. [Ans. $x = -1$]

In Exercises 16–23, write the standard form of the equation of the specified circle.

16. Center: $(0, 0)$; radius: 3.
17. Center: $(0, 0)$; radius: 6.
18. Center: $(2, -1)$; radius: 4.
19. Center: $(0, \frac{1}{3})$; radius: $\frac{1}{3}$.
20. Center: $(-1, 2)$; solution point: $(0, 0)$.
21. Center: $(3, -2)$; solution point: $(-1, 1)$.
22. Endpoints of a diameter: $(0, 0)$, $(6, 8)$.
23. Endpoints of a diameter: $(-4, -1)$, $(4, 1)$.

In Exercises 24–27, find the center and radius, and sketch the circle.

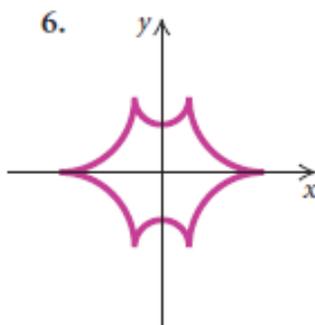
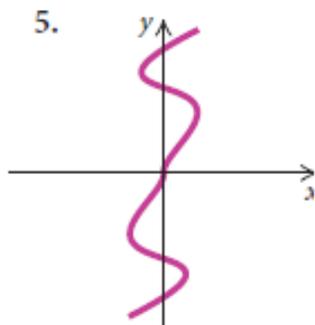
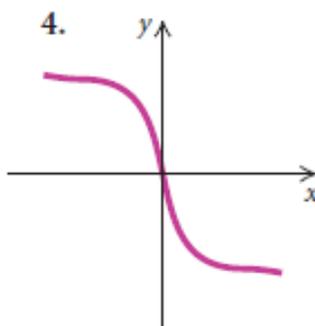
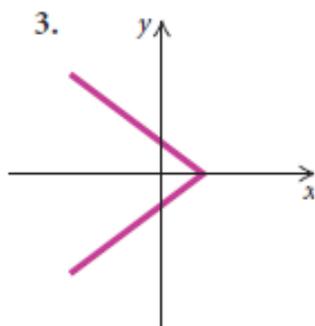
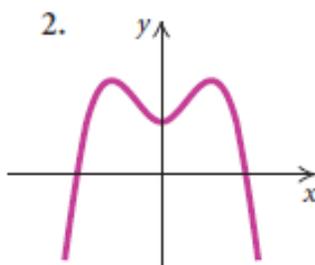
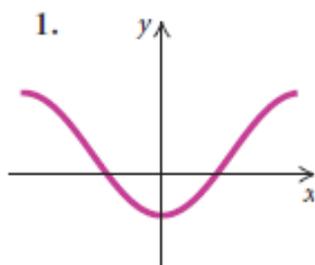
24. $x^2 + y^2 = 25$

25. $x^2 + y^2 = 16$

26. $(x-1)^2 + (y+3)^2 = 4$

27. $x^2 + (y-1)^2 = 49$

28. Determine visually whether each of the graphs shown below is symmetric with respect to the x -axis, the y -axis, and the origin.



29. Test algebraically whether the graph of the equation $x^2 + 4 = 3y$ is symmetric with respect to the x -axis, the y -axis, and the origin.

30. Graph the equation $x^2 + 4 = 3y$ and determine visually whether it is symmetric with respect to the x -axis, the y -axis, and the origin.