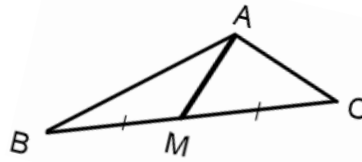


2.3 Equations of Medians, Altitudes, and Perpendicular Bisectors

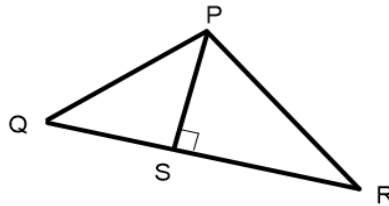
In your solutions you must include a properly labeled diagram and use exact values (do NOT round).

1. A triangle has vertices $A(-3, 7)$, $B(4, -5)$, and $C(9, -3)$. Determine the equation of the median from B .
2. Determine the equation of the perpendicular bisector of the line segment from $D(7, -3)$ to $E(3, 4)$.
3. Triangle FGH has vertices $F(4, 5)$, $G(-3, 2)$, and $H(5, -2)$. Determine the equation of the altitude from vertex G .
4. A triangle has vertices $J(4, -3)$, $K(-1, -2)$, and $L(7, 3)$. Determine the equation of the altitude from vertex K .
5. A triangle has vertices $M(3, -1)$, $N(4, 0)$, and $P(3, -5)$. Determine the equation of the median from N .
6. A triangle has vertices $Q(6, -4)$, $R(5, 2)$, and $S(1, 4)$. Determine the equation of the perpendicular bisector of QR .

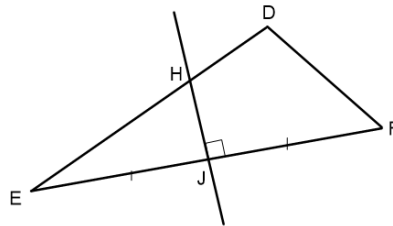
7. Given $A(2, 5)$, $B(-2, 1)$, and $C(6, 1)$:
 - a) Classify line AM
 - b) State the coordinates of M
 - c) State slope of AM
 - d) State equation of AM



8. Given $P(1, 9)$, $Q(-3, 2)$, and $R(7, 0)$:
 - a) Classify line PS
 - b) State the slope of QR
 - c) State slope of PS
 - d) State equation of PS



9. Given $D(0, 5)$, $E(-3, -2)$, and $F(3, 1)$:
 - a) Classify line HJ
 - b) State the coordinates of J
 - c) State slope of HJ
 - d) State equation of HJ



10. Determine the equation for the right bisector of the line segment joining $A(3, 6)$ and $B(-1, 2)$.
11. Triangle ABC has vertices $A(3, 4)$, $B(-5, 2)$, $C(1, -4)$. Determine an equation for
 - a) CD , the median from C to AB
 - b) AE , the altitude from A to BC
 - c) GH , the right bisector of AC
12. A triangle with vertices $X(0, 0)$, $Y(4, 4)$, and $Z(8, -4)$
 - a) Write an equation for each of the three medians
 - b) Write an equation of each of the altitudes.

Answers:

- | | | | | |
|--|---------------------------------------|--------------------------------------|---|------------------|
| 1. $y = -7x + 23$ | 2. $y = \frac{4}{7}x - \frac{33}{14}$ | 3. $y = \frac{1}{7}x + \frac{17}{7}$ | 4. $y = -\frac{1}{2}x - \frac{5}{2}$ | 5. $y = 3x - 12$ |
| 6. $y = \frac{1}{6}x - \frac{23}{12}$ | 7. d) $x = 2$ | 8. d) $y = 5x + 4$ | 9. d) $y = -2x - \frac{1}{2}$ | 10. $y = -x + 5$ |
| 11. a) $y = -\frac{7}{2}x - \frac{1}{2}$ | b) $y = x + 1$ | c) $y = -\frac{1}{4}x + \frac{1}{2}$ | 12. a) $x = 4$, $y = 0$, $y = -x + 4$ | |