

Calculator Problem

$$m_1 = 1/6, m_2 = -2, m_3 = -1/2.$$

$$l_1 \cap l_2, \tan \theta = -13/4, \theta = 1.8692952 \text{ or } 107.10272^\circ$$

$$l_1 \cap l_3, \tan \theta = 8/11, \theta = 0.6287962 \text{ or } 36.027373^\circ$$

$$l_2 \cap l_3, \tan \theta = 3/4, \theta = 0.6435011 \text{ or } 36.869891^\circ$$

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1. -5

3. 12/13

4. $x = 5 - d/5\sqrt{2}$ and $y = -4 + d/5\sqrt{2}$ is one pair of parametric equations.

5. (0, 1)

6. $x - 4y - 17 = 0$

7. $2x + 3y - 5 = 0$

8. $m = 2/3, (0, -2)$

9. (1, 2)

10. $m = -A/B$

11. If $l_1 \perp l_2$, then $m_1 m_2 = -1$. If $l_1 \parallel l_2$, then $m_1 = m_2$.

13. $y = -2x + 7$

12. Perpendicular

15. $\tan \theta = 1, \theta = \pi/4$

14. $y = -3x - 12$

16. The lines l_1 and l_2 are perpendicular since $a_1 a_2 + b_1 b_2 = 0$, or $(1 \cdot 3) + (-3 \cdot 1) = 0$. Therefore, l_3 will bisect the angle between l_1 and l_2 if it forms an angle of $\pi/4$ with either line. $m_1 = 1/3, m_3 = 2$. If θ is the angle between l_3 and l_1 , we have

$$\tan \theta = \frac{2 - (1/3)}{1 + 2(1/3)} = \frac{5/3}{5/3} = 1.$$

Hence, $\theta = \pi/4$ and l_3 bisects the angle between l_1 and l_2 .