

Parallel and Perpendicular Lines: math test, Grade 10

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Suggested time: 45 minutes. Out of 20 points. Calculator allowed only when the problem says so.

1 Angles and algebra

/ 4 pts

Parallel lines a and b are cut by a transversal. Two alternate interior angles measure $(7x - 4)^\circ$ and $(5x + 16)^\circ$.

- Write and solve an equation for x . (2 points)
- Find the measure of the angles. (1 point)
- Find the measure of a same-side interior angle of one of them. (1 point)

2 Prove parallel

/ 3 pts

A transversal crosses lines p and q . Two same-side interior angles measure 118° and 62° .

- (a) Are p and q parallel? Justify. (b) If the angles measured 118° and 64° instead, what would you conclude?

3 Slopes of three lines

/ 4 pts

Line ℓ_1 passes through $(-3, 4)$ and $(1, -2)$. Line ℓ_2 passes through $(0, 1)$ and $(3, 3)$. Line ℓ_3 passes through $(-1, 5)$ and $(3, -1)$. Find the three slopes (3 points) and name the relation between ℓ_1 and ℓ_2 , and between ℓ_1 and ℓ_3 (1 point).

4 Writing equations

/ 4 pts

Line m is $y = -\frac{3}{4}x + 2$. Write an equation of (a) the line through $(8, -1)$ parallel to m (2 points), and (b) the line through $(8, -1)$ perpendicular to m (2 points).

5 Distance to a line

/ 3 pts

Find the distance from the point $P(1, 2)$ to the line $3x + 4y + 5 = 0$. Show your work.

6 Perpendicular bisector

/ 2 pts

Find the equation of the perpendicular bisector of the segment joining $A(-1, 0)$ and $B(5, 4)$.



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