

Universidad de Puerto Rico
Departamento de Matemáticas
MATE 3018 – Repaso 2–

Apellidos: _____ Nombre _____
No. Estudiante: _____ Profesor: _____ Sección _____

(1) Solve the following equalities and inequalities over the set of real numbers \mathbb{R} .

(a) $5x - 7 \leq -8x - 9$

(b) $7x + 11 \geq 18x - 13$

(c) $-3x - 12 \leq -17x + 15$

(d) $|7 - x| \geq 5$

(e) $x^2 + 3 \leq x$

(f) $6x^2 - 21x + 18 = 0$

(g) $|5x + 4| \geq 0$

(h) $x^2 + 13 > 0$

(i) $|5x - 4| = |7 - 13x|$

(j) $|x^2 - 2x + 1| \geq |x - 1|$

(k) $\frac{x^2 - 1}{2x + 1} \leq 0$

$$(l) \frac{(x-2)(x-3)}{x+1} \geq 0$$

$$(m) \frac{x-3}{2x-1} > 2(x-2)$$

$$(n) \frac{|x+3|}{|2x-1|} < 1$$

$$(o) \frac{|x-5|}{|x-2|} \geq 2$$

(2) Find a and b such that $(5a + 11, -3b + 5) = (4, -5)$.

(3) Find the distance between the points (a, b) and $(4a, 5b)$.

(4) Find an equation of the line that passes through the point $(-2, -3)$ and $(7, -5)$.

(5) Find an equation of the line with slope $m = 3/5$ and passes through the origin.

(6) Find the midpoint of the segment with endpoints $(3, 6)$ and $(-5, 2)$.

- (7) If the midpoint of the segment AB is $(3, 9)$ and $A = (-3, -7)$, find the coordinates of B .
- (8) Find an equation of the mediatrix of the segment with endpoints $(5, 9)$ and $(-5, 6)$.
- (9) Determine if the points with coordinates $(0, 2)$, $(1, 5)$, $(-1, -1)$ are collinear.
- (10) **(9 Pts)** Find an **equation for the line** with the given properties.
- (a) Slope -3 and y -Intercept 3 .
- (b) x -Intercept 2 and y -Intercept -1
- (c) Perpendicular to the line $y - 2x = -5$ and contains the point $(0, 4)$.
- (11) Find the center and the radius of the circle with equation $(x + 2)^2 + (y - 3)^2 = 5$.
- (12) Find the center and the radius of the circle with equation $x^2 + y^2 - 3x - 9y = -4$.
- (13) Find an equation of the circle with center $(-2, -3)$ and tangent to the line $y = 7$.

(14) Find an equation of the circle with center on the line $y = 3x$ and tangent to the y -axis at the point $(0, 2)$.

(15) Find an equation of the tangent line to the circle with equation $(x - 3)^2 + (y - 2)^2 = 13$ at the point $(0, -4)$.

(16) (**12 Pts**) Find the equation of the circle that contains the point $A = (0, 0)$, $B = (2, 4)$ and $C = (3, 3)$.