

MATH 251
WORK SHEET #1

1. Solve the inequality

a: $|3x + 1| < |x - 2|$, b: $\frac{2}{x+3} \geq \frac{1}{2}$.

2. Find the radius and the centre of the circle $x^2 - 4x + y^2 + 2y = 11$.

3. Solve the inequality

a: $|x - 1| + 2 > 0$, b: $\frac{3}{x-1} \leq \frac{2}{x-3}$.

4. Given four lines $l_1 : 3x - 2y = 1$, $l_2 : 2y + 3x = 0$, $l_3 : 3x + 2y = 3$,
 $l_4 : 2x + 3y = 2$. Choose all which are

a: parallel, b: perpendicular.

5. Solve the inequality

a: $\frac{1}{x+1} \geq 1 + x$, b: $|3x + 2| > 0$.

6. Find an equation of the line perpendicular to the x -axis passing through the point $(1, -3)$.

7. Solve the inequality

a: $2x + 7 > x^2$, b: $\frac{x}{2} < \frac{3}{x+2}$.

8. Find the vertex of the parabola $y + 2x^2 + 6x + 1 = 0$.

9. Answer TRUE or FALSE for each of the following questions:

a: $\lfloor -3.107 \rfloor = -3$, b: $0.\overline{215} < \frac{215}{999}$,

c: $f(x) = x \cos(\frac{3\pi}{2} + x)$ is an even function.

10. Which of the given circles has bigger radius

$$x^2 - 6x + y^2 = 7 \quad \text{or} \quad x^2 + y^2 + 2y = 15 ?$$