INEQUALITIES INVOLVING ABSOLUTE VALUE AND SQUARE ROOTS

1 $\dfrac{1}{|x|} < 3$ (Hint: The denominator is known to be non-negative.)

2 (a) On the same axes sketch $y = 1 - |x|$ and $y = 3x$.   **(b)** Hence solve $|x| + 3x > 1$.

4 Solve $x^2 - |x| > 0$.

5 **(a)** On the same axes sketch $y = |x-2|$ and $y = \dfrac{1}{x}$.   **(b)** Hence solve $|x-2| > \dfrac{1}{x}$.

6 Solve $\dfrac{x}{x+1} < 1$. (*Note:* This looks like a standard problem, but in fact requires some analysis, depending on which method you use.)

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7 Solve $\left|\dfrac{1-x}{2x+1}\right| \geq 1.$ (Hint: $|2x+1|$ is known to be non-negative.)

9 (a) On the same axes sketch $y = |x+1|$ and $y = |x-5|$.

(b) Hence graph $y = |x+1| + |x-5|$.

(c) Solve $|x+1| + |x-5| > 7$.

(d) Solve $|x+1| + |x-5| = 6$.