1. No calculators are allowed.
2. No notes or books are allowed.
3. Show your work and make your methods clear. Unjustified answers will receive no credit, except for true/false questions.

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1. (2 points each) Are the followings true (T) or false (F) ?

(a) $\sqrt{2^2} = 2$

(b) $\sqrt{(-3)^2} = -3$

(c) $|4 - 12| = |4| - |12|

(d) $5^{-4/3} = -\sqrt[3]{5^4}$

(e) Every real number is a solution of the equation $\frac{x + 1}{x + 1} = 1$.

(f) $\frac{3x - y}{3} = x - y$

(g) If $x < 5$ then $-5x < -25$

(h) $(x + y) = x^2 + y^2$

(i) $(pz)^0 = 0$

(j) $2^{-2} < 0$
2. (5 points each)

(a) Draw the line $5x - 2y - 20 = 0$.

(b) Find the equation of the line through $(6, 4)$ and $(-4, -1)$.

(c) Find the equation of the line through $(3, 4)$ and has undefined slope.

(d) Find the equation of the line through $(-2, 3)$ that is perpendicular to the line $y = 2x$. 
3. Find the solution sets of the followings:

(a) (10 points) \[|−2x + 1| − 7 > 0\]

(b) (15 points)

\[4 \leq 3 - 2x < 8 \quad \text{AND} \quad -2 + 3x \geq x - 5\]

(c) (10 points)

\[
\begin{align*}
\frac{5}{2}x - 2y &= 4 \\
2x + \frac{3}{2}y &= 13
\end{align*}
\]
4. Find the real number solutions of the following if there’s any:

(a) (10 points) \( \frac{1}{t + 3} + \frac{4}{t + 5} = \frac{2}{t^2 + 8t + 15} \)

(b) (10 points) \( x\sqrt{2} = \sqrt{5x - 2} \)

(c) (10 points) \( 3p^2 = 6p - 4 \)
5. (a) (10 points) Add and write in lowest terms \( \frac{5}{x^2 + 6x + 9} + \frac{2}{x^2 + 4x + 3} \)

(b) (10 points) Simplify \( \frac{m^{-1} + p^{-2}}{2m^{-2} - p^{-1}} \)
6. Simplify the followings assuming that all variables represent positive numbers.

(a) (10 points) $9\sqrt[3]{5q^7} - 2q\sqrt[3]{40q^4}$

(b) (10 points) $\sqrt[5]{128x^{100}t^{36}}$

(c) (10 points) $\left(\frac{a^6b^{-2}}{2a^{-2}}\right)^{-1} \left(\frac{2b^{-1}a^2}{3b^{-2}}\right)^{-2}$
7. Solve the following equations:

(a) (5 points) \(3x - 5 - 2(3x - 4) = 4 - 5x + 7 - 8(x - 2)\)

(b) (10 points) \((2x - 3)^2 - 121 = 0\)

(c) (10 points) \(x^{10} - 5x^5 + 4\)
8. (a) (10 points) Rationalize \( \frac{3 - \sqrt{2}}{(\sqrt{5})^2} \)

(b) (10 points) Rationalize \( \frac{2 - \sqrt{3}}{\sqrt{2} - \sqrt{5}} \)