Sample Gateway Exam 1

You must get at least 7 out of 8 problems on some Gateway Exam in order to get a C or better in Math 140. No calculators.

1. Expand \((2s + 5t)^2 - 3st\) and then simplify with no parentheses in the final answer.

\[4s^2 + 17st + 25t^2\]

2. Factor \(81c^3 + 90c^2 + 25c\).

\[c(9c + 5)^2\]

3(a). Write as one inequality with an absolute value: \(t < -3\) or \(2 < t\).

\[|t + \frac{1}{2}| > \frac{5}{2}\]

3(b). Solve \(|t + 3| < 4\). Write the answer with two inequalities and no absolute value signs.

\(-7 < t\) and \(t < 1\)

4. Let \(g(d) = \sqrt[1/2]{1/d}\). State the domain of \(g\) and compute \(g(1/16)\).

Domain: \(d > 0\). \(g(1/16) = 2\)

5. Complete the square for \(3c^2 + 3c - 7\).

\[3(c + \frac{1}{2})^2 - \frac{31}{4}\]

6. Simplify \(y^{1/2}(\frac{1}{y} + 2\sqrt{y} + y^{-1/3})\).

\[y^{-1/2} + 2y + y^{1/6}\]

7. Solve for \(n\): \(\frac{2^{5/3}}{4^{7/3}} = 2^n\).

\(n = -3\)

8. Find all real numbers \(b\) such that \(\sqrt{b} = b\).

\(b = 0, 1\)