

**1.**

[4 points]

Write the following as  $a\sqrt{3}$  (part (a)) or  $a\sqrt[3]{2}$  (part (b)):

(a)  $2\sqrt{12} - 3\sqrt{75} + \sqrt{147}$

(b)  $4\sqrt[3]{16} + 2\sqrt[3]{54} - \sqrt[3]{2000}$

**2.**

[4 points]

Simplify the following fractions:

(a)  $\frac{(x^3y^{-2})^2 \times (2xy^4)^{-1}}{(x^{-1}y)^2 \times (4x^2y^{-1})^{-1}}$

(b)  $\frac{((2a^2b)^{-1}c^3)^2 \times (a^3bc^{-2})^{-1}}{(4a^{-1}b^2c)^3 \times (a^2b^{-1}c^3)^{-2}}$

**3.**

[4 points]

Rationalize the denominator in the following fractions (simplify your answers):

(a)  $\frac{12}{\sqrt{3}}$

(b)  $\frac{10}{\sqrt[3]{25}}$

(c)  $\frac{4}{\sqrt{6} + 2}$