1 Math101 exercises

1.1 Rewrite the fractions such that the denominator becomes 7:

$$2, \qquad \frac{2}{14}, \qquad \frac{50}{35}, \qquad \frac{3}{-7}.$$

1.2 Calculate the following powers:

$$3^2, \qquad (-1)^3, \qquad 2^3, \qquad 5^2, \qquad (-2)^{-2}.$$

1.3 Calculate the following roots:

$$\sqrt{0}, \qquad \sqrt{9}, \qquad \sqrt{\frac{1}{36}}, \qquad \sqrt{\sqrt{16}}.$$

1.4 Reduce the expressions:

$$(x-1)^2 - (x-1)(x+1), \qquad (3x+y)^2 - (x^2+5xy).$$

1.5 Calculate the following:

$$\frac{2}{3} - \frac{4}{3}, \qquad 4 \cdot \frac{3}{8}, \qquad \frac{1}{2} - \frac{1}{3} + \frac{1}{4}, \qquad \frac{5}{4} \cdot \frac{3}{2}, \qquad \frac{\frac{3}{2}}{\frac{1}{4}}.$$

1.6 Calculate the following powers

$$\left(\frac{3}{2}\right)^3, \qquad \frac{2^2}{2^5}, \qquad 3^2 \cdot 3^{-2}, \qquad \frac{2^{-10}}{2^{-11}}.$$

1.7 Reduce the following fractions:

$$\frac{x^2+4-4x}{x-2}, \qquad \frac{4x^2-4}{4x+4}, \qquad \frac{2x^2+6x}{x^2+9+6x}.$$

1.8 Reduce the expressions:

$$\frac{\sqrt{8}}{2}, \qquad \frac{2}{\sqrt{2}}, \qquad \frac{\sqrt{27}}{\sqrt{54}}, \qquad \frac{4}{\sqrt{8}}.$$

1.9 Calculate the following:

$$\frac{4}{5}\left(\frac{1}{3} + \frac{5}{12}\right), \qquad \left(\frac{1}{2} + \frac{1}{4}\right)\left(\frac{12}{20} - \frac{1}{5}\right).$$

1.10 Reduce the expressions:

$$\frac{(xy^2)^2}{xy^3}, \qquad \frac{(x^2)^{-1}}{x}, \qquad (3x)^2x^3.$$

1.11 Rewrite the following expressions to powers:

$$x\sqrt{x}, \qquad \sqrt{x^5}, \qquad \frac{\sqrt{x}}{x^2}, \qquad x^2\sqrt[3]{x}.$$