SOLUTIONS

1. Simplify the following and express your answer as a single number (as an improper fraction if necessary).

   (a) (2 points) $\dfrac{2^2 \cdot (8^3)^3}{(4^2 \cdot 2^4)^2 \cdot 2^7}$

   Solution:
   64

   (b) (2 points) $\left(\dfrac{35}{3}\right)^6 \cdot \dfrac{27^2}{25^3} \cdot \left(\dfrac{6}{7^3}\right)^2$

   Solution:
   36

   (c) (2 points) $\left(\dfrac{11}{3^{-1} \cdot 49}\right)^{-4} \cdot \left(\dfrac{33}{12^2}\right)^{-3} \div \left(\dfrac{50^2}{11^3}\right)^2 \cdot \left(\dfrac{14^4}{11 \cdot 5^4}\right)^{-2}$

   Solution:

   11/3

2. Simplify the following and express your answer in positive index form.

(a) (2 points) $b^{-19} \cdot (b^{-3})^{-5} \cdot \left(\frac{1}{b^{-2}}\right)^4$

Solution:
b^4

(b) (2 points) $\frac{p^2q^{-3}}{(p^2q^3)^5} \cdot ((pq^3)^{-2})^{-3} \cdot \left(\frac{p^3 \cdot q^{-1}}{p^2}\right)^3$

Solution:
$\frac{p}{q^3}$

(c) (2 points) $\frac{\frac{(fg^2)^3 \cdot f^{-6}}{(gf)^{-3}} \cdot \left(\frac{fg^2}{(g^{-1})^{-2}}\right)^3}{\frac{(f^{-1}g)^4(g^2f)^2}{g^{-2}} \div \frac{g^{-5}}{(gf)^2}}$

Solution:

$$\frac{f^3}{g^8}$$