Harder Simplify Practice #3

Fully simplify the following expressions:

1. $\frac{x}{3} \times \frac{6xy}{5}$
2. $(8xyz)^2$
3. $10x^2 \div 15x^4$
4. $\frac{1}{2x^2} \times \frac{xy}{5}$
5. 0.1^{-2}
6. $(0.1x^3)^3$
7. $3 \div {}^-9x^2$
8. $\sqrt{16x^2}$
9. $8p^3q \div 2p^2q$
10. $5xy + 2x - 8y + xy$

11. $x - (y - x) - y$
12. $2xy \div 10x^3$
13. $x\,y^2 - 3y^2x$
14. $\frac{x}{4} \div \frac{8}{x}$
15. $\left(\frac{3}{4z}\right)^2$
16. $\frac{12}{x} \div \frac{3}{x^2}$
17. $10\,xy^2 \div {}^-35x$
18. $\left(\frac{ab^2}{2}\right)^2$
19. $2 - ((x - 2) - 3)$
20. $\frac{6 - 9y}{-3}$

Answers: Harder Simplify Practice #3

Some working stages are shown, but answers must be in the simplest form

1. $\frac{x}{3} \times \frac{6xy}{5}$ $= \frac{6\ x^2\ y}{15}$ $= \frac{2x^2y}{5}$ or $0.4\,x^2y$

2. $(8xyz)^2$ $= 8xyz \times 8xyz$ $= 64\,x^2\,y^2\,z^2$

3. $10x^2 \div 15x^4$ $= \frac{10\ x^2}{15\ x^4}$ $= \frac{2}{3x^2}$ or $\frac{2}{3}\,x^{-2}$ (or, less good, = $\frac{0.666666}{x^2}$)

4. $\frac{1}{2x^2} \times \frac{xy}{5}$ $= \frac{1\ x\ y}{10\ x^2}$ $= \frac{y}{10x}$ or $0.1\,y\,x^{-1}$

5. 0.1^{-2} $= \frac{1}{0.1^2}$ $= \frac{1}{0.01}$ $= 100$

6. $(0.1x^3)^3$ $= 0.1x^3 \times 0.1x^3 \times 0.1x^3$ $= 0.001x^9$ or $\frac{x^9}{1000}$

7. $3 \div {}^-9x^2$ $= \frac{-3}{9x^2}$ $= \frac{-1}{3x^2}$ or $\frac{-1}{3}\,x^{-2}$ (with – on **top** of fraction)

8. $\sqrt{16x^2}$ $= 4x$

9. $8p^3q \div 2p^2q$ $= \frac{8\ p^3\ q}{2\ p^2\ q}$ $= 4p$

10. $5xy + 2x - 8y + xy$ $= 6xy + 2x - 8y$

11. $x - (y - x) - y$ $= x - y + x - y$ $= 2x - 2y$

12. $2xy \div 10x^3$ $= \frac{2\,x^1\,y}{10\,x^3}$ $= \frac{y}{5x^2}$ or $0.2\,x^{-2}\,y$ etc

13. $x\,y^2 - 3y^2x$ $= {}^-2\,x\,y^2$ or ${}^-2\,y^2\,x$

14. $\frac{x}{4} \div \frac{8}{x}$ $= \frac{x}{4} \times \frac{x}{8}$ $= \frac{x^2}{32}$

15. $\left(\frac{3}{4z}\right)^2$ $= \frac{3}{4z} \times \frac{3}{4z}$ $= \frac{9}{16z^2}$ or $0.5625\,z^{-2}$

16. $\frac{12}{x} \div \frac{3}{x^2}$ $= \frac{12}{x} \times \frac{x^2}{3}$ $= 4x$

17. $10\,x\,y^2 \div {}^-35x$ $= \frac{10\,x\,y^2}{-35\,x}$ $= \frac{-2y^2}{7}$ or $\frac{-2}{7}\,y^2$

18. $\left(\frac{ab^2}{2}\right)^2$ $= \frac{ab^2}{2} \times \frac{ab^2}{2}$ $= \frac{a^2b^4}{4}$ or $¼\,a^2\,b^2$

19. $2 - ((x - 2) - 3)$ $= 2 - (x - 5)$ $= x + 7$

20. $\frac{6 - 9y}{-3}$ $= \frac{6}{-3} + \frac{-9y}{-3}$ $= 3y - 2$