

## Homework: Exponents and radicals

*Do these problems without a calculator. Answer the first page on loose leaf paper.*

Simplify, leaving no negative or fractional exponents.

1.  $(\frac{1}{x^{-2}} - 4)^2 \times \frac{1}{5}x^{-4}y^3$
2.  $\frac{x^2\sqrt{12x^6}}{xy\sqrt[5]{32x^{-5}}}$
3.  $a^3b^{-3} \div a^{-4}b^{\frac{1}{2}}$
4.  $\frac{6}{5}(x^{-2}y)^2 \times \frac{1}{3}(x^4y^{-1})$
5.  $25^{\frac{3}{2}}$
6.  $\sqrt[3]{\frac{16a^9b^{-3}}{z^{-4}}}$
7.  $\sqrt{20}$
8.  $\sqrt{12x^4}$
9.  $4\sqrt{x} - 3\sqrt{x}$
10.  $\frac{1}{2}\sqrt{ab^2} + \frac{3}{2}b\sqrt{a}$
11.  $x^2\sqrt{xy^3} + 3y\sqrt{xy}$
12.  $(x^2 + x - 5)(x - 1)$
13.  $(2x^2 - 4x + 1)(3x - 1)$
14. Let  $f(x) = (4x + 8)^2 - 3x$  and  $g(x) = \frac{1}{2}x - 2$ . Find  $(f \circ g)(x)$

Express each item as fractions with rational denominators.

15.  $\frac{1}{\sqrt{2}}$
16.  $\frac{1-x}{\sqrt{x}}$
17.  $\frac{7}{3+\sqrt{5}}$
18.  $\frac{x^2-3}{x-\sqrt{3}}$

19. Let  $f(x) = x^2 - 5x + 4$  and  $g(x) = x - 1$

- (a) Rewrite  $f$  in vertex form and state the vertex as an ordered pair.
- (b) Factor the function  $f$  and write down its roots.
- (c) Graph the function  $f$ , labeling it. Mark the intercepts and graph the axis of symmetry as a dotted line, labeling it with its equation.
- (d) Graph  $g$  and label it with its name or equation.
- (e) Mark the intersections of  $f$  and  $g$  as ordered pairs.
- (f) Select one of the solutions and show that it satisfies the system by substituting it into both functions.

