

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.

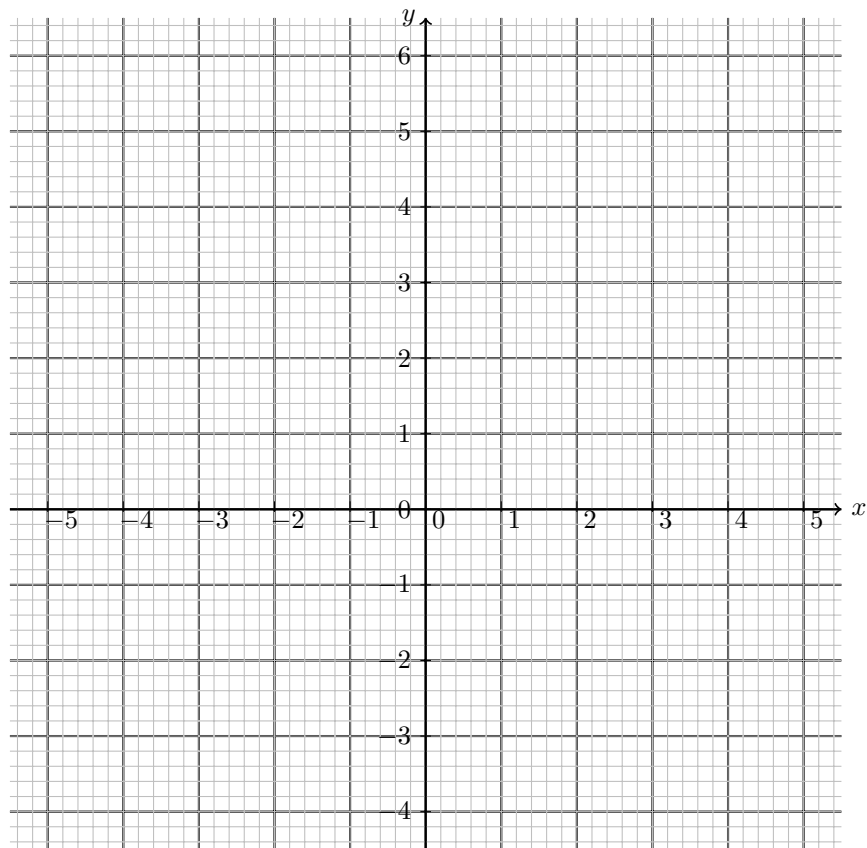
1. $(\frac{1}{x^{-2}} - 4)^2 \times \frac{1}{5}x^{-4}y^3$
2. $\frac{x^2\sqrt{12x^6}}{xy\sqrt[5]{32x^{-5}}}$
3. $a^3b^{-3} \div a^{-4}b^{\frac{1}{2}}$
4. $\frac{6}{5}(x^{-2}y)^2 \times \frac{1}{3}(x^4y^{-1})$
5. $25^{\frac{3}{2}}$
6. $\sqrt[3]{\frac{16a^9b^{-3}}{z^{-4}}}$
7. $\sqrt{20}$
8. $\sqrt{12x^4}$
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.

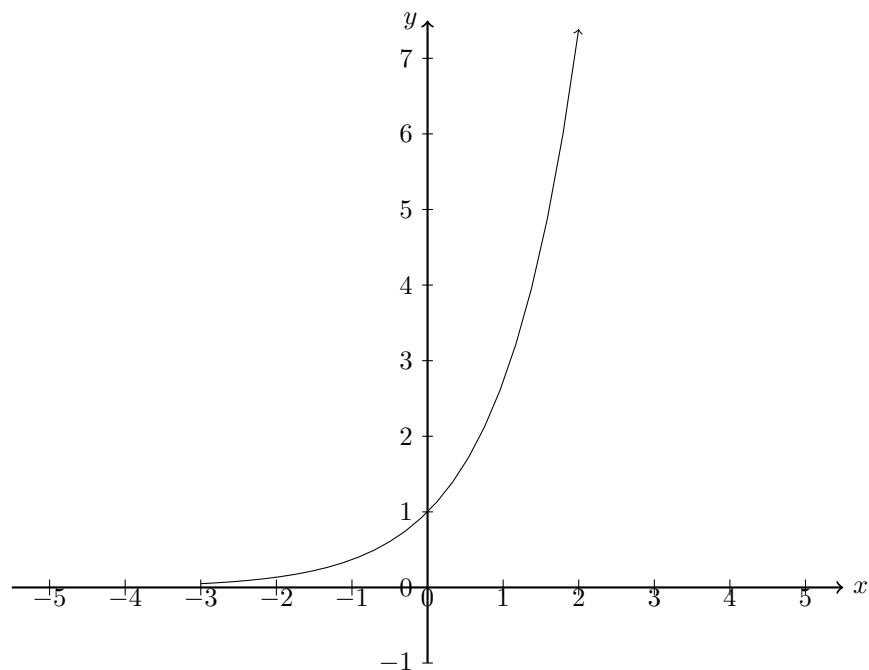
15. $\frac{1}{\sqrt{2}}$
16. $\frac{1-x}{\sqrt{x}}$
17. $\frac{7}{3+\sqrt{5}}$
18. $\frac{x^2-3}{x-\sqrt{3}}$

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

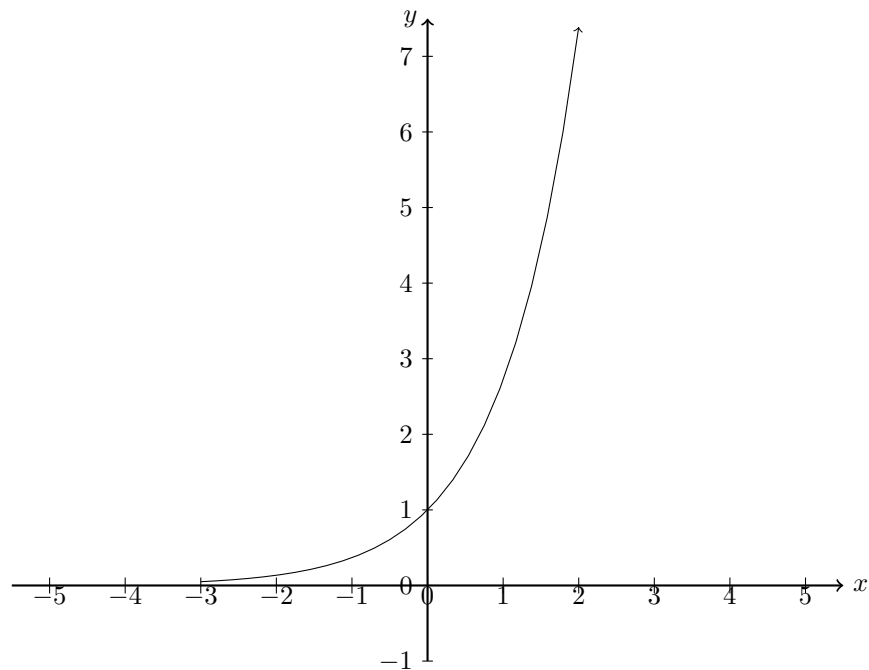
- (a) Rewrite f in vertex form and state the vertex as an ordered pair.
- (b) Factor the function f and write down its roots.
- (c) Graph the function f , labeling it. Mark the intercepts and graph the axis of symmetry as a dotted line, labeling it with its equation.
- (d) Graph g and label it with its 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.



20. The function $f(x) = e^x$ is shown on the graph. Sketch $g(x) = f(x - 3)$.



21. The function $f(x) = e^x$ is shown on the graph. Sketch $g(x) = f(-x) + 2$. Plot and label the asymptote.



22. Graph the function $f(x) = x^2 - 4$ over the domain $x \geq 0$ on the grid below.

(a) Label the y -intercept as an ordered pair.

(b) Label the point representing the solution to the equation $f(x) = 0$ as an ordered pair.

(c) Write down the value of $f^{-1}(-3)$ and label the point $(f^{-1}(-3), -3)$.

(d) Graph the inverse function, $f^{-1}(x)$.

