

Review: Exponents and radicals (easier)

Do these problems without a calculator. Use algebra properties to simplify each expression.

Exponent rules

1. $4x^2 \times x^4y^3$

2. $a^3b \div a^2$

3. $(x^2y^2)^2 \times (x^3y)$

4. $(\frac{1}{2}x^3)^2$

Fractional and negative exponents

Simplify. Express as fractions or radicals

5. $49^{\frac{1}{2}}$

6. $(xy)^{\frac{1}{2}}$

7. $(ab)^{-1}$

8. $(x^2y)^{-2}$

Radicals and exponents

Simplify, leaving no negative or fractional exponents.

9. $\sqrt{x^4y^2}$

10. $\frac{\sqrt[3]{8x}}{4}$

11. $\sqrt{\frac{x^2y^6}{z^4}}$

Review: Exponents and radicals (challenge)

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

Simplify, leaving no negative or fractional exponents.

1. $\frac{3}{4}a^{-3} \times a^3b^{-3}$

2. $\frac{2\sqrt{36x^2}}{\sqrt[3]{27x^3}}$

3. $x^3y^{-2} \times (\frac{x}{y^2})^{-1}$

4. $(-2x^2y)^2$

5. $\frac{2}{3}(x^{-2}y)^3 \times \frac{6}{11}(x^2y^{-1})$

6. $49^{\frac{1}{4}}$

7. $\sqrt[3]{\frac{a^3b^{-9}}{z^{-6}}}$

8. Let $f(x) = x^2 - 6x - 7$.

- (a) Show that the roots of $f(x)$ are 7 and -1 .
- (b) Rewrite $f(x)$ in vertex form. (complete the square)
- (c) Hence, state the vertex as an ordered pair.
- (d) The function $g(x)$ is made by translating $f(x)$ right two units and up one unit. Write down the vertex of $g(x)$.
- (e) Find the y -intercept of $g(x)$.
- (f) Find the zeros of $g(x)$.

9. Let $f(x) = (x - 3)^2 - 4x$ and $g(x) = 2x - 5$.

- (a) Find $g^{-1}(x)$
- (b) Find $(f \circ g)(x)$

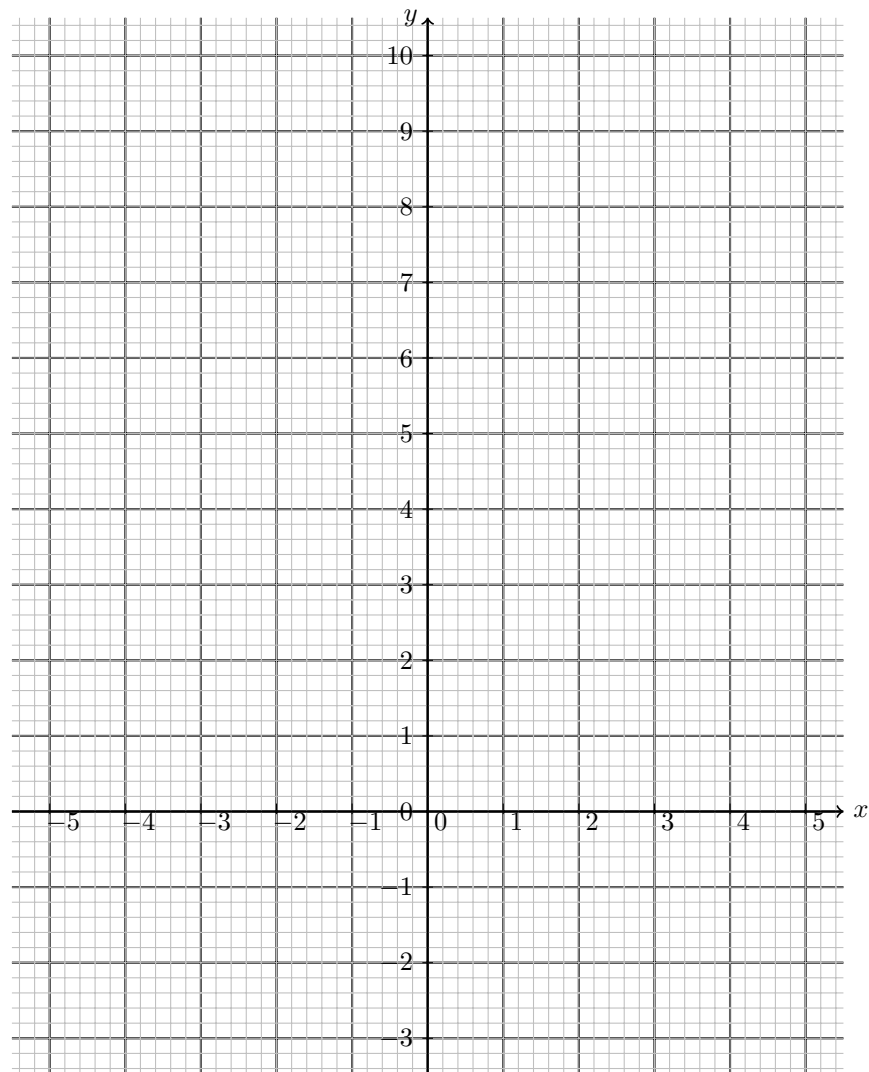
10. Let $f(x) = 2x^2 + kx + 2$.

- (a) $f(x)$ has exactly one root. Find k .
- (b) $g(x) = -f(x) + 4$. Find the solution(s) to $g(x) = f(x)$

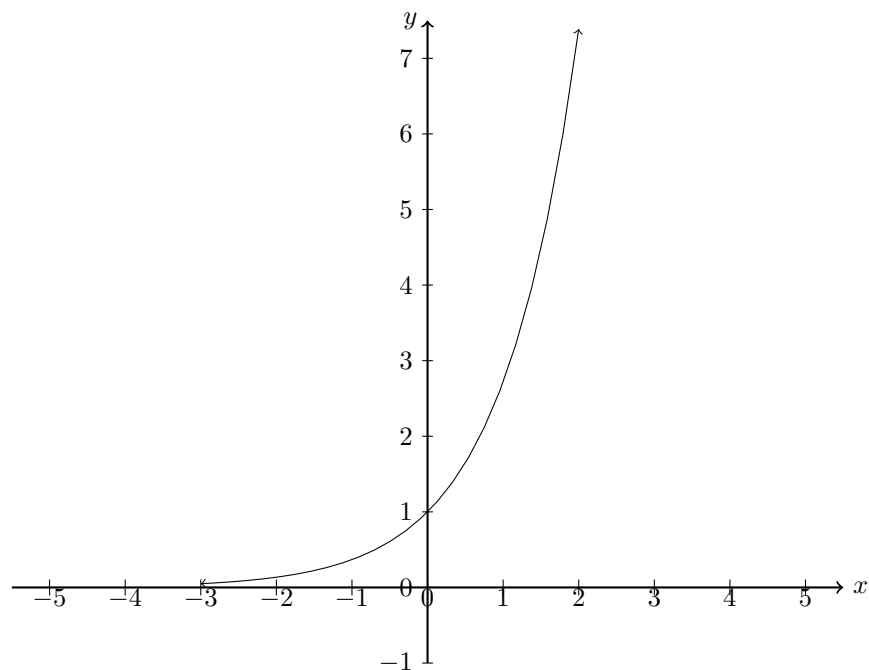
11. Let $f(x) = x^2 + 3x - 1$ and $g(x) = 2x - 3$. Find $(f \times g)(x)$

12. Let $f(x) = \frac{1}{3}(3)^x$, for $-3 \leq x \leq 3$.

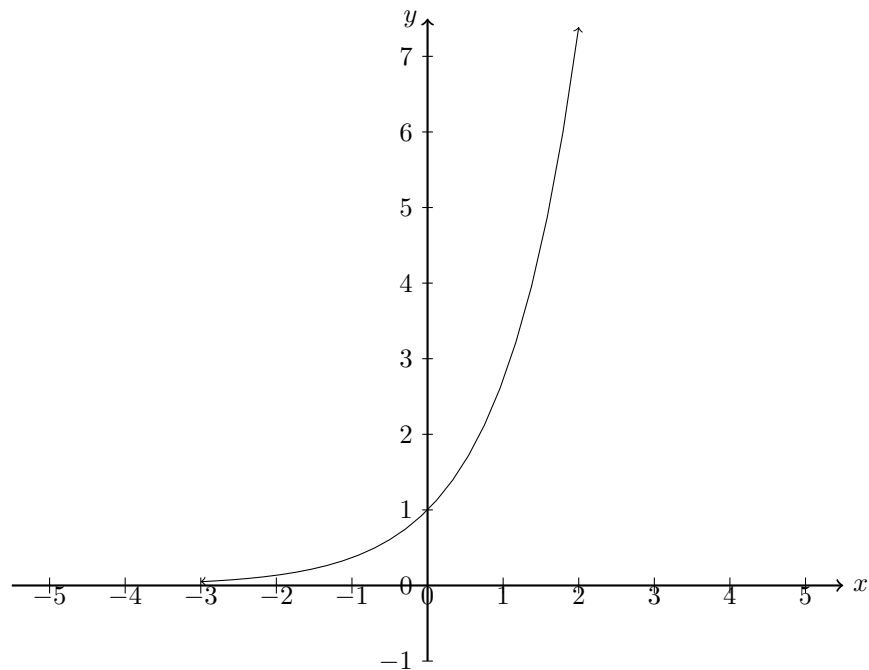
- (a) On the grid below, graph f .
- (b) Write down the value of $f(0)$.
- (c) Using the graph, solve for $f(x) = 1$.
- (d) What is the value of $f^{-1}(9)$?



13. The function $f(x) = e^x$ is shown on the graph. Sketch $g(x) = f(x) + 1$. Plot and label the asymptote.



14. The function $f(x) = e^x$ is shown on the graph. Sketch $g(x) = -f(x) + 5$. Plot and label the asymptote.



15. Graph the function $f(x) = 2^x$ on the grid below.

- (a) Label the y -intercept as an ordered pair.
- (b) Label the point representing the solution to the equation $f(x) = 4$ as an ordered pair.
- (c) Write down the value of $f^{-1}(\frac{1}{2})$ and label the point on the graph of f .
- (d) Graph the inverse function, $f^{-1}(x)$.
Hint: plot the three points above, reversing the x and y .

