

# Homework: Functions review

*Answer in the space provided.*

1. Let  $f(x) = 2x^2 + 5x$  and  $g(x) = 3x + \frac{3}{2}$

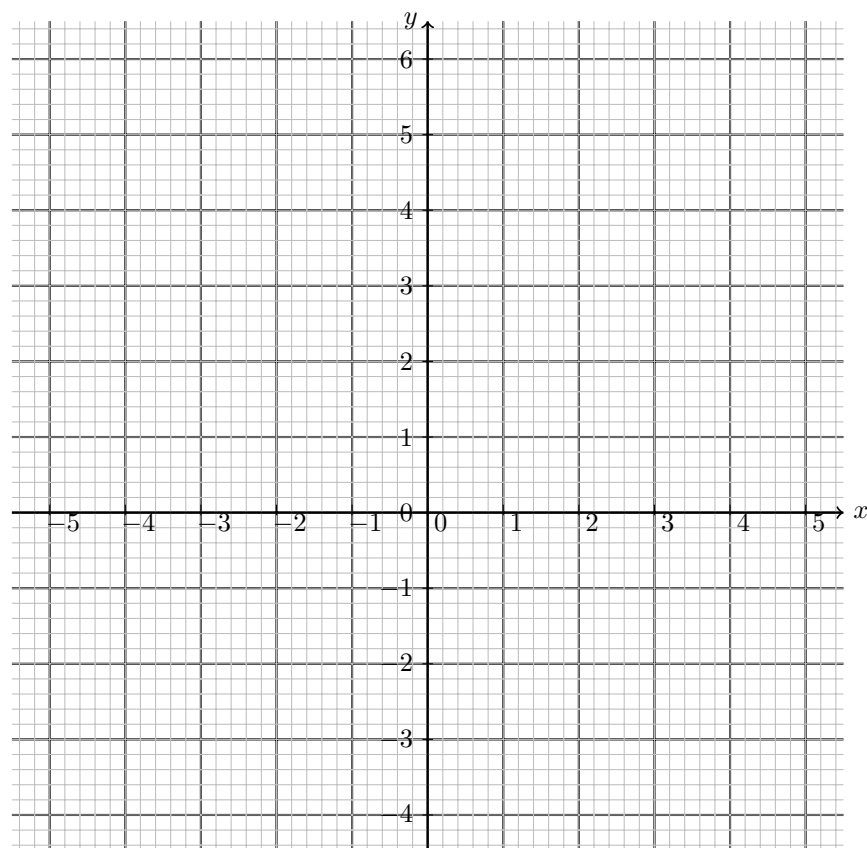
(a) Rewrite  $f$  in vertex form and state the vertex as an ordered pair.

(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.



Simplify, leaving no negative or fractional exponents.

2.  $(3x)^2 y^3 \times \frac{4}{9} x^3 y^{-1}$

3.  $\sqrt[3]{a^{-3}b^4}$

4.  $x^{\frac{3}{2}} \times \left(\frac{x^3}{z^3}\right)^{\frac{2}{3}}$

5.  $(a^0 b^3)^{\frac{1}{2}} \div a^{-3} b^{\frac{2}{3}}$

6. Let  $f(x) = \sqrt{x} - 16$  and  $g(x) = (x - 4)^2$

(a) Find  $(f \circ g)(x)$

(b) Find  $g^{-1}(x)$

7. The function  $f(x) = e^x$  is shown on the graph.

(a) On the graph. Label the point  $A(0, f(0))$

(b) Sketch  $g(x) = -f(x + 1) + 2$ .

(c) Draw the asymptote of the function  $g$ . Label it with its equation.

(d) The point  $B(k, g(k))$  is the image of  $A$ . Plot  $B$  and label it's coordinates as an ordered pair.

(e) Describe the transformation mapping  $f$  to  $g$ . (hint: this requires an answer in complete sentences, e.g. "The function  $f$  was shifted horizontally ...reflected, and then ....")

