

1. Simplify each expression using the product rule for exponents: $a^m a^n = a^{m+n}$. Actually write out the step to help you remember the rule for the long haul.

a. $x^6 x^{14}$ b. $b^{17} b^8$ c. $w^2 w^9$ d. $y y^{28}$ e. $x x$ f. $x^{16} x^{-6}$

(I know we aren't doing problems with negative exponents in this class, I'm just trying to get it into your head that the rules will work the same way when you start using negative exponents in MTH 65 ... that's why it's important that you actually write the steps out now ... so that you really internalize that when you see something of form $a^m a^n$ you add the exponents, regardless of the nature of the exponents.)

2. Simplify each expression using the power to a power rule for exponents $(a^m)^n = a^{mn}$. Actually write out the step to help you remember the rule for the long haul.

a. $(t^4)^6$ b. $(m^8)^3$ c. $(2^2)^3$ d. $(y^9)^1$ e. $(p^{-7})^{-3}$ f. $(x^{1/2})^2$

(I know we aren't doing problems with negative or fractional exponents in this class, I'm just trying to get it into your head that the rules will work the same way when you start using negative exponents in MTH 65 and when you start using fractional exponents in MTH 95 ... that's why it's important that you actually write the steps out now ... so that you really internalize that when you see something of form $(a^m)^n$ you multiply the exponents, regardless of the nature of the exponents.)

3. For each expression decide whether you need to add the exponents or multiply the exponents and then go ahead and do it.

a. $(t^4)^2$ b. $u^4 u^2$ c. $j^5 j^{10}$ d. $k^{19} k$ e. $(r^1)^{17}$ f. $v^{1/2} v^{1/2}$

4. Decide whether each statement is true or false.

a. $(3+4)^2 = 3^2 + 4^2$ b. $(3 \cdot 4)^2 = 3^2 \cdot 4^2$ c. $(1 \cdot 5)^3 = 1^3 \cdot 5^3$ d. $(1+5)^3 = 1^3 + 5^3$

5. Multiple choice: which of the following statements are true statements?

- a. Exponents distribute over addition.
- b. Exponents distribute over multiplication.
- c. Both (a) and (b) are true statements.
- d. Neither (a) nor (b) is a true statement.

6. Completely simplify each expression.

- a. $(2y)^4$ b. $(x^2 x^5)^3$ c. $(-2x^4)(2x^4 y^2)$ d. $(3x)(2x^4)^3$
- e. $(-2bc^3)^4$ f. $(-k^8)^6$ g. $3x^5 + x^5$ h. $(3x^5)(x^5)$

7. Do each of the following for each given function.

- a. State the values of $f(0)$ and $f(2)$.
- b. Find the value(s) of x that make $f(x) = 2$.
- c. Find and state the domain and range of f . State the domain and range using interval notation.

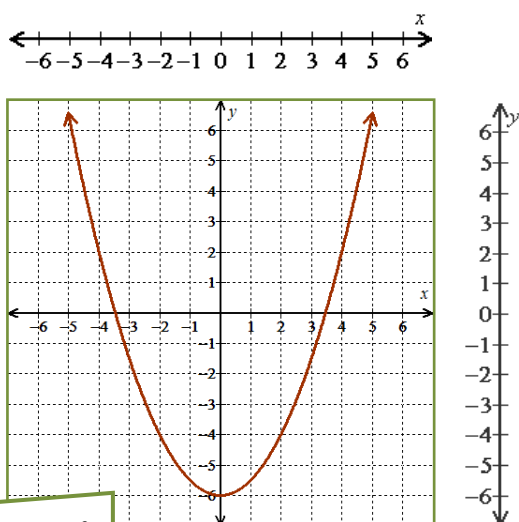


Figure 1: f

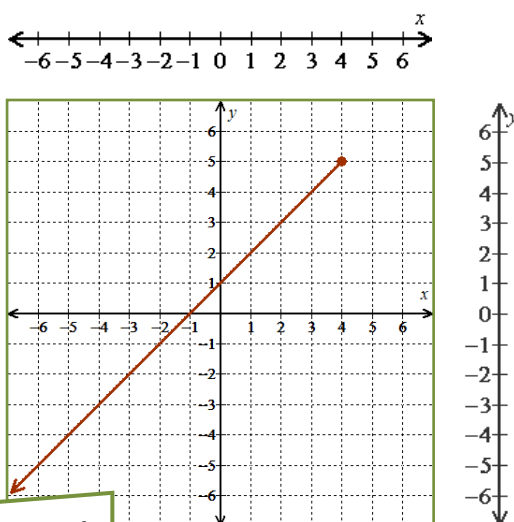


Figure 2: f

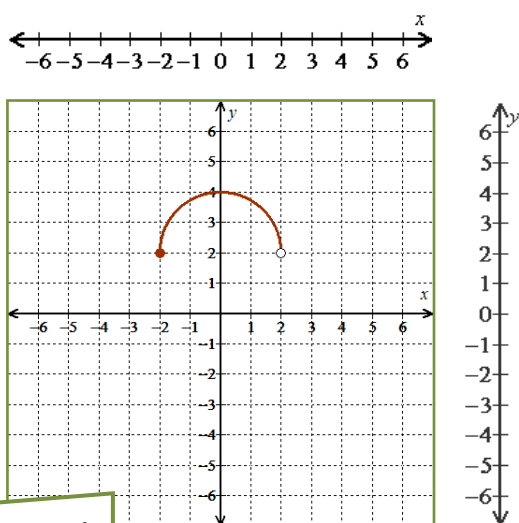


Figure 3: f

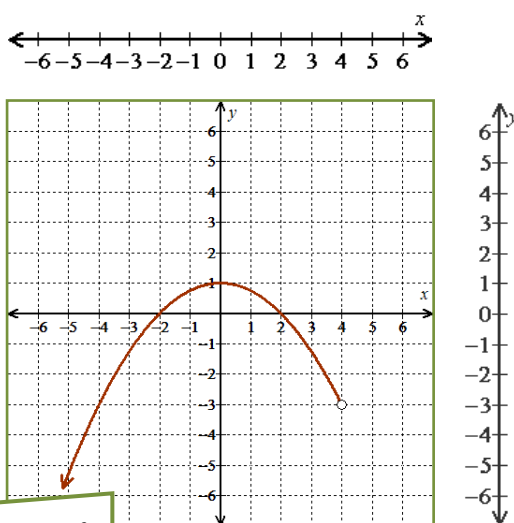


Figure 4: f