Students will be able to:

- Solve Direct Variation Application Problems
- Solve Inverse Variation Application problems
- Solve Joint Variation Application problems

Functions and symbols that WeBWorK understands.

Links to some useful WeBWorK pages for students

1. (1 pt) Suppose r varies directly with t and that $r = 30$ when $t = 6$. What is the value of r when $t = 12$?

$r = $ _____

2. (1 pt) Suppose p varies directly as the square of q. If $p = 3$ when $q = 8$, what is p if q is 10?

$p = $ _____

3. (1 pt) State sales tax y is directly proportional to retail price x. An item that sells for 146 dollars has a sales tax of 14.42 dollars. Find a mathematical model that gives the amount of sales tax y in terms of the retail price x.

Your answer is $y = $ _____

What is the sales tax on a 270 dollars purchase.

Your answer is: _____

4. (1 pt) Suppose p varies directly with q and that $p = 56$ when $q = 8$. What is the value of p when $q = 2$?

$p = $ _____

5. (1 pt) At 3:00 PM a man 143 cm tall casts a shadow 148 cm long. At the same time, a tall building nearby casts a shadow 160 m long. How tall is the building? _____

Give your answer in meters. (You may need the fact that 100 cm = 1 m.)

6. (1 pt) Suppose z varies inversely with t and that $z = 30$ when $t = 7$. What is the value of z when $t = 6$?

$z = $ _____

7. (1 pt) Suppose f varies inversely with g and that $f = 40$ when $g = 4$. What is the value of f when $g = 10$?

$f = $ _____

8. (1 pt) Suppose p varies jointly as the cube root of q and the cube of r. If $p = 15$ when $q = 8$ and $r = 15$, what is p if $q = 5$ and $r = 1$?

$p = $ _____

9. (1 pt) Suppose z varies directly with x and inversely with the square of y. If $z = 12$ when $x = 3$ and $y = 5$, what is z when $x = 12$ and $y = 8$?

$z = $ _____

10. (1 pt) If p varies jointly as t and r and inversely as q, then find an equation for p if $p = -5$ when $t = -1$, $r = -2$, and $q = -1$.

$p = $ _____

11. (1 pt) If q varies jointly as p and the cube of t and inversely as r, then find an equation for q if $q = -8$ when $t = 1$, $p = 2$, and $r = 7$.

$q = $ _____

12. (1 pt) Suppose z varies directly with y and directly with the cube of x. If $z = 648$ when $x = 3$ and $y = 8$, what is z when $x = 7$ and $y = 5$?

$z = $ _____

13. (1 pt) If t varies jointly as q and p and inversely as r, then find an equation for t if $t = 4$ when $q = 8$, $p = 9$, and $r = 2$.

$t = $ _____

14. (1 pt) Suppose p varies jointly as the cube of q and the cube root of r. If $p = 14$ when $q = 10$ and $r = 1$, what is p if $q = 6$ and $r = 14$?
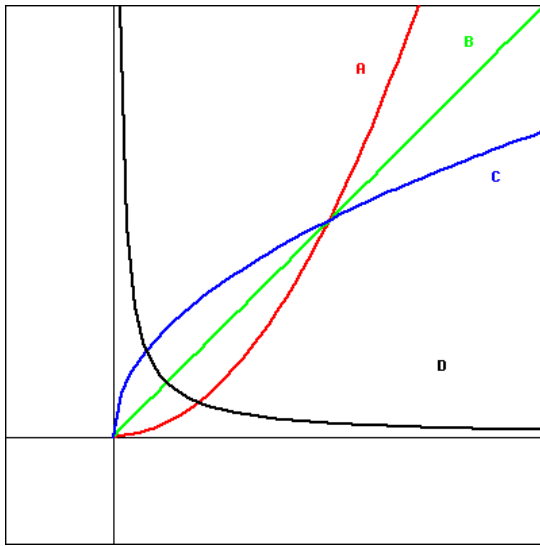
$p = $ _____

15. (1 pt) The stopping distance d of an automobile is directly proportional to the square of its speed v. A car required 75 feet to stop when its speed was 70 miles per hour. Find a mathematical model that gives the stopping distance d in terms of its speed v.

Your answer is $d = $ _____

Estimate the stopping distance if the brakes are applied when the car is traveling at 50 miles per hour.

Your answer is: _____

most closely resembles the graph of that function. You may always assume that the constant of variation k is positive.

Warning: You have only 4 attempts at this problem so make them count!

$y = kx^8$ ____ $y = kx^{.70}$ ____

$y = kx^{\frac{1}{4}}$ ____ $y = \frac{k}{x^{2.5}}$ ____

$y = kx^{.55}$ ____ $y = kx^{\frac{4}{7}}$ ____

16. (1 pt)

For each power function, choose (by letter) the graph which