Date Completed: _____
Mentor Initials: _____

Direct and Inverse Variation

1. Given that a varies inversely as b, if $a = 5$ when $b = 2$, what is the value of a when $b = 1$?

A) 2
B) 2.5
C) 10
D) 20

2. The number of high heels Theresa May buys varies directly with her score on the stress scale (out of 10). On Monday, she scored a 3 on the stress scale and bought 12 pairs of high heels. On Tuesday, if she scores a 6 on the stress scale, how pairs of high heels with she buy?

A) 6
B) 15
C) 24
D) 36

3. Given that c varies directly as d, if $c = 10$ when $d = 2$, what is the value of d when $c = 15$?

A) $\frac{4}{3}$
B) 2
C) 3
D) 4

4. The number of Kardashians is inversely proportional to the time it takes to read an essay. It takes 3 Kardasians 7 hours to read an extended essay analyzing the impact their reality show has had on the lifestyles of woman. How long would it take 5 Kardashians to read the same essay?

A) 2.1 hours
B) 3.5 hours
C) 4.2 hours
D) 11.6 hours

5. Given that g varies directly as the $square$ of h, if $g = 27$ when $h = 3$, what is g when $h = 5$?

A) 75
B) 45
C) 32
D) 9

6. Lucas purchases a new compass to find "True North". The storekeeper tells him that the price of the compass varies inversely with the level of precision. A compass that is 5° off costs $\$4.50$. How much will a compass that is 2° off cost, in dollars?

A) $\$2.22$
B) $\$5.55$
C) $\$7.50$
D) $\$11.25$

7. Given that p varies inversely as the *cube* of q. If $p = 6$ when $q = 1$, what is the value of p when $q = 2$?

A) $\frac{3}{4}$
B) 3
C) 12
D) 24

8. A person's *body mass index*, BMI, varies directly as the person's weight in pounds and inversely as the square of the person's height in feet. If k represents the constant of variation, which of the following expressions represents the BMI of a person who weighs w pounds and is f feet tall?

A) $\frac{k}{wf^2}$
B) $\frac{kw}{f^2}$
C) $\frac{kf^2}{w}$
D) $\frac{wf^2}{k}$

9. Given that y varies jointly with the *square* of x and the *square root* of z, if $y = 54$ when $x = 3$ and $z = 4$, what is the value of y when $x = 2$ and $z = 25$?

A) 9.6
B) 30
C) 60
D) 225

10. Let k be a constant of proportionality and let $r, s, t,$ and u be positive real number variables. In which of the following equations does u vary directly with r, directly with the square root of s, and inversely with the square of t?

A) $u = \frac{k\sqrt{s}}{rt^2}$

B) $u = \frac{kr\sqrt{s}}{t^2}$

C) $u = \frac{kr}{\sqrt{s}t^2}$

D $u = \frac{kt^2}{r\sqrt{s}}$