

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Regents Review Day 1: Expressions, Equations & Rate

<p>1. Konnor wants to burn 250 Calories while exercising for 45 minutes at the gym. On the treadmill, he can burn 6 Cal/min. On the stationary bike, he can burn 5 Cal/min. If <math>t</math> represents the number of minutes on the treadmill and <math>b</math> represents the number of minutes on the stationary bike, which expression represents the number of Calories that Konnor can burn on the stationary bike?</p> <p>1) <math>b</math>                  2) <math>5b</math>                  3) <math>45 - b</math>                  4) <math>250 - 5b</math></p> <p style="color: blue; font-size: 1.2em;">5 calories per <math>b</math> minutes  <math>5b</math></p>	<p>2. An equation is given below.  <math>4(x - 7) = 0.3(x + 2) + 2.11</math></p> <p>The solution to the equation is</p> <p>1) 8.3                  2) 8.7                  3) 3                  4) -3</p> <p style="color: blue;"> <math>4(x - 7) = .3(x + 2) + 2.11</math>  <math>4x - 28 = .3x + .6 + 2.11</math>  <math>4x - 28 = .3x + 2.71</math>  <math>\quad + 28 \quad \quad + 28</math>  <math>4x = .3x + 30.71</math>  <math>-.3x \quad -.3x</math>  <math>3.7x = 30.71</math>  <math>\frac{3.7x}{3.7} = \frac{30.71}{3.7} = 8.3</math> </p>
<p>3. Sandy programmed a website's checkout process with an equation to calculate the amount customers will be charged when they download songs. The website offers a discount. If one song is bought at the full price of \$1.29, then each additional song is \$.99. State an equation that represents the cost, <math>C</math>, when <math>s</math> songs are downloaded. Sandy figured she would be charged \$52.77 for 52 songs. Is this the correct amount? Justify your answer.</p> <p style="color: blue; font-size: 1.2em;"> <math>\\$1.29 + .99(51)</math>  <math>\\$51.78</math> </p>	<p>4. The equation for the volume of a cylinder is <math>V = \pi r^2 h</math>. The positive value of <math>r</math>, in terms of <math>h</math> and <math>V</math>, is</p> <p>1) <math>r = \sqrt{\frac{V}{\pi h}}</math>                  2) <math>r = \sqrt{V\pi h}</math>                  3) <math>r = 2V\pi h</math>                  4) <math>r = \frac{V}{2\pi}</math></p> <p style="color: blue; font-size: 1.2em;"> <math>V = \pi r^2 h</math>  <math>\frac{V}{\pi h} = \frac{\pi r^2 h}{\pi h}</math>  <math>\sqrt{\frac{V}{\pi h}} = \sqrt{r^2}</math>  <math>\sqrt{\frac{V}{\pi h}} = r</math> </p>

$C = \underline{\underline{1.29 + .99(s - 1)}}$

5. A construction worker needs to move 120 ft<sup>3</sup> of dirt by using a wheelbarrow. One wheelbarrow load holds 8 ft<sup>3</sup> of dirt and each load takes him 10 minutes to complete. One correct way to figure out the number of hours he would need to complete this job is

1)  $\frac{120 \text{ ft}^3}{1} \cdot \frac{10 \text{ min}}{1 \text{ load}} \cdot \frac{60 \text{ min}}{1 \text{ hr}} \cdot \frac{1 \text{ load}}{8 \text{ ft}^3}$   $\frac{\text{min}^2}{\text{h}}$

2)  $\frac{120 \text{ ft}^3}{1} \cdot \frac{60 \text{ min}}{1 \text{ hr}} \cdot \frac{8 \text{ ft}^3}{10 \text{ min}} \cdot \frac{1 \text{ load}}{1}$

3)  $\frac{120 \text{ ft}^3}{1} \cdot \frac{1 \text{ load}}{10 \text{ min}} \cdot \frac{8 \text{ ft}^3}{1 \text{ load}} \cdot \frac{1 \text{ hr}}{60 \text{ min}}$

4)  $\frac{120 \text{ ft}^3}{1} \cdot \frac{1 \text{ load}}{8 \text{ ft}^3} \cdot \frac{10 \text{ min}}{1 \text{ load}} \cdot \frac{1 \text{ hr}}{60 \text{ min}}$

6. Patricia is trying to compare the average rainfall of New York to that of Arizona. A comparison between these two states for the months of July through September would be best measured in

- 1) feet per hour
- 2) inches per hour
- 3) inches per month
- 4) feet per month

7. Given the functions g(x), f(x), and h(x) shown below:

①  $g(x) = x^2 - 2x$   $(0,0)$   $(3,3)$   $\frac{\Delta y}{\Delta x} = \frac{0-3}{0-3} = \frac{-3}{-3} = 1$

x	f(x)
0	1
1	2
2	5
3	7

②  $\frac{\Delta y}{\Delta x} = \frac{7-1}{3-0} = \frac{6}{3} = 2$

③  $\frac{\text{rise}}{\text{run}} = \frac{7}{3} = 2\frac{1}{3}$

$(0,2)$   
 $(3,9)$   
 $\frac{\Delta y}{\Delta x} = \frac{9-2}{3-0} = \frac{7}{3} = 2\frac{1}{3}$   
 $h(x), f(x), g(x)$

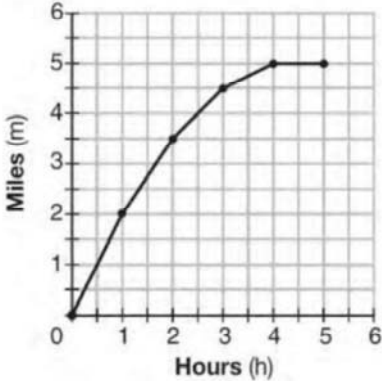
The correct list of functions ordered from greatest to least by average rate of change over the interval  $0 \leq x \leq 3$  is

- 1) f(x), g(x), h(x)
- 2) h(x), g(x), f(x)

- 3) g(x), f(x), h(x)
- ④ h(x), f(x), g(x)

↓ SLOPE  $\frac{\Delta y}{\Delta x}$

Homework Questions/Practice

<p>1. To watch a varsity basketball game, spectators must buy a ticket at the door. The cost of an adult ticket is \$3.00 and the cost of a student ticket is \$1.50. If the number of adult tickets sold is represented by <math>a</math> and student tickets sold by <math>s</math>, which expression represents the amount of money collected at the door from the ticket sales?</p> <p>1) <math>4.50as</math>                  2) <math>4.50(a + s)</math>                  3) <math>(3.00a)(1.50s)</math>                  4) <math>3.00a + 1.50s</math></p>	<p>2. Which value of <math>x</math> satisfies the equation <math>\frac{7}{3}\left(x + \frac{9}{28}\right) = 20</math>?</p> <p>1) 8.25                  2) 8.89                  3) 19.25                  4) 44.92</p>
<p>3. The distance a free falling object has traveled can be modeled by the equation <math>d = \frac{1}{2}at^2</math>, where <math>a</math> is acceleration due to gravity and <math>t</math> is the amount of time the object has fallen. What is <math>t</math> in terms of <math>a</math> and <math>d</math>?</p> <p>1) <math>t = \sqrt{\frac{da}{2}}</math>                  2) <math>t = \sqrt{\frac{2d}{a}}</math>                  3) <math>t = \left(\frac{da}{d}\right)^2</math>                  4) <math>t = \left(\frac{2d}{a}\right)^2</math></p>	<p>4. The graph below shows the distance in miles, <math>m</math>, hiked from a camp in <math>h</math> hours.</p>  <p>Which hourly interval had the greatest rate of change?</p> <p>1) hour 0 to hour 1                  2) hour 1 to hour 2                  3) hour 2 to hour 3                  4) hour 3 to hour 4</p>

5. A family is traveling from their home to a vacation resort hotel. The table below shows their distance from home as a function of time.

<b>Time (hrs)</b>	0	2	5	7
<b>Distance (mi)</b>	0	140	375	480

Determine the average rate of change between hour 2 and hour 7, including units.