ثانويـة التكنولوجيـا التطبيقيـة
Applied Technology High School

# Math

## Grade 10- H.O.T problems

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|---|---|
| Name: …… | Grade:10 |
| Duration: (20 min ) | Section: …… |

**Lesson 2-1 Relations and Functions**

**H.O.T problems**

**Q1:- FIND THE ERROR** Omar and Madison are finding $f(3d)$ for the function $f(x) = -4x^2 - 2x + 1$. Is either of them correct? Explain your reasoning.

**Omar**

$$f(3d) = -4(3d)^2 - 2(3d) + 1$$
$$= -4(9d^2) - 6d + 1$$
$$= -36d^2 - 6d + 1$$

**Madison**

$$f(3d) = -4(3d)^2 - 2(3d) + 1$$
$$= 12d^2 - 6d + 1$$

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**Q2:- CHALLENGE** Consider the functions $f(x)$ and $g(x)$. $f(a) = 19$ and $g(a) = 33$, while $f(b) = 31$ and $g(b) = 51$. If $a = 5$ and $b = 8$, find two possible functions to represent $f(x)$ and $g(x)$.

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**Q3:- REASONING** If the graph of a relation crosses the $y$-axis at more than one point, is the relation *sometimes*, *always*, or *never* a function? Explain your reasoning.

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Q4:-**REASONING** Determine whether the following statement is *true* or *false*. Explain your reasoning.

*If a function is onto, then it must be one-to-one as well.*

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Q5:- **WRITING IN MATH** Explain why the vertical line test can determine if a relation is a function.

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The end of Sec. 2.1

## Lesson 2-2 Linear Relations and Functions
## H.O.T problems

**Q1:-** **REASONING** Determine whether an equation of the form $x = a$, where $a$ is a constant, is *sometimes*, *always*, or *never* a function. Explain your reasoning.

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**Q2:-** **WHICH ONE DOESN'T BELONG?** Of the four equations shown, identify the one that does not belong. Explain your reasoning.

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|---|---|---|---|
| $y = 2x + 3$ | $2x + y = 5$ | $y = 5$ | $y = 2xy$ |

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**Q3:-** **WRITING IN MATH** Consider the graph of the relationship between hours worked and earnings.

**a.** Why do you think the graph of this relationship should only be in the first quadrant?

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**b.** Provide another example of a situation in which only the first quadrant is needed Explain your reasoning.

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**The end of Sec. 2.2**

## Lesson 2-3 Rate of Change and Slope
## H.O.T problems

**Q1:- FIND THE ERROR** Patty and Tim are asked to find the slope of the line passing through the points (4, 3) and (7, 9). Is either of them correct? Explain.

**Patty**

$$m = \frac{9-3}{7-4}$$

$$= \frac{6}{3} \text{ or } 2$$

**Tim**

$$m = \frac{7-4}{9-3}$$

$$= \frac{3}{6} \text{ or } \frac{1}{2}$$

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**Q2:- CHALLENGE** The graph of a line passes through the points (2, 3) and (5, 8). Explain how you would find the $y$-coordinate of the point $(11, y)$ on the same line. Then find $y$.

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**Q3:- WRITING IN MATH** Describe the process of finding the rate of change for each.

**a.** a table of values **b.** a graph **c.** an equation

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## The end of Sec. 2.3

## H.O.T problems

Q1:- **WRITING IN MATH** Describe the process of finding the slope-intercept form of the equation of a line containing two given points.

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## The end of Sec. 2.4

**Q1:-** **FIND THE ERROR** Carla and Kimi are determining if $f(x) = 2x$ is the *identity function*. Is either of them correct? Explain your reasoning.

**Carla**

f(x) = 2x is the identity function because it is linear and goes through the origin.

**Kimi**

*f(x) = 2x is not the identity function because the values in the domain do not correspond to their duplicates in the range.*

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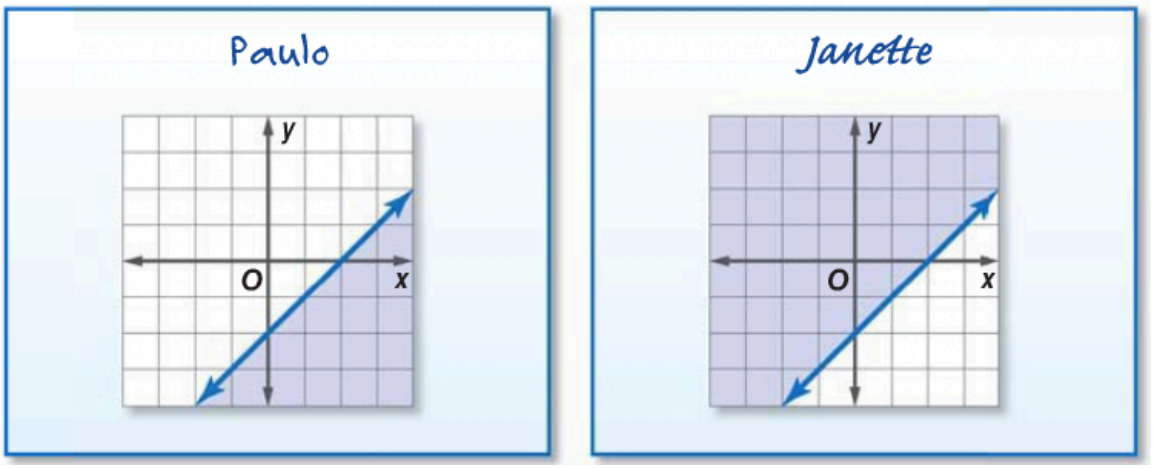
**The end of Sec. 2.7**

**Q1:-FIND THE ERROR** Paulo and Janette are graphing $x - y \geq 2$. Is either of them correct? Explain your reasoning.

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The end of Sec. 2.8