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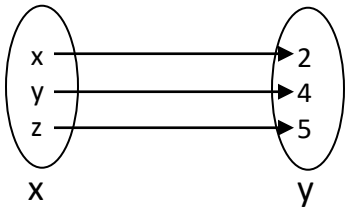
Unit 2 - Functions, Equations, and Graphs Test Review Guide

1. State the domain and range for the following relation.

   {(2,a), (4,b), (6,c), (8,d)}

2. State whether relation is a function or not?



Solve the equations (Q3-Q8)

3. $x - 4 = 4$

4. $3x = 18$

5. $\frac{3}{4}x = 12$

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6. $3(4x-3)=2(x-5)$

7. $\frac{x}{2}-\frac{x}{6}=15$

8. $\frac{x}{2}-\frac{x}{6}=\frac{2}{5}$

9. Find value of y when k=2, x=6

Find the missing values of x and y. (Q10-Q13)

10.

x	2	3	5.5	?
y	?	3.6	?	9.6

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11.

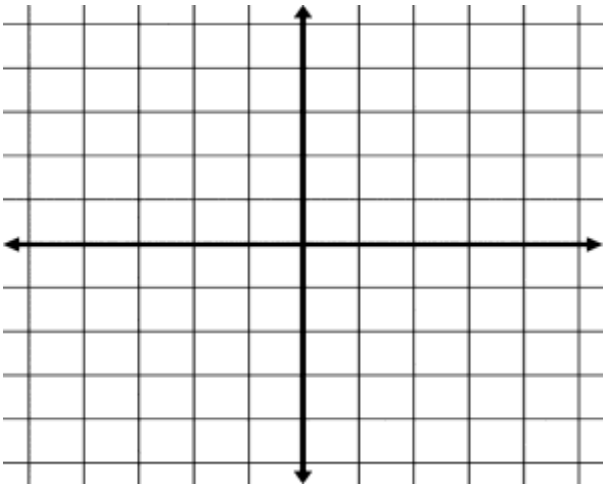
x	4	5	7	?
y	?	15	?	24

12.

x	3	5	7	?
y	5	?	?	24

Plot the following regression equations on graph.

13. $\hat{y} = 8 + 0.5x$



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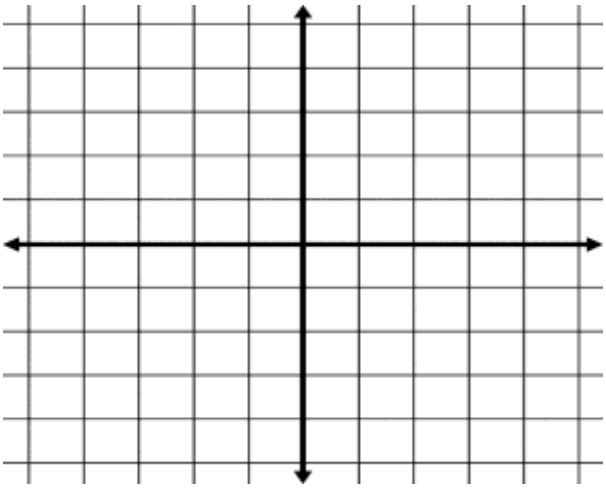
14. $\hat{y} = -3 + 2x$



15. **Find the regression lines from following data:**

$$\Sigma x = 68, \quad \Sigma y = 50, \quad \Sigma xy = 670 \quad \Sigma x^2 = 68 \ and \ n = 5$$

Mark as True or False

16. f(x) = $[x]$ is called absolute value function. (True/False)
17. Graph of f(x)= mx+c can be obtained by putting mx+c=0. (True/False)
18. $f^2 = f[f(x)]$ (True/False)
19. If g(x)=2x+5 then g^2 =2x+9 (True/False)
20. Inequalities in two variables do not change when a negative number is multiplied. (True/False)

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Chooses appropriate answer:

21. Absolute value is represented by a symbol:
    a. <> b. | |
    c. ∈ d. ∅

22. The graph obtained from the absolute value function shapes like:
    a. Curve b. V
    c. Straight Line d. U

23. Families of functions refers to the generating:
    a. Constants from the functions b. Variables from the functions
    c. More functions from the function d. None of these

24. In general, f(g)……
    a. = g(f) b. ≥ g(f)
    c. ±g(f) d. ≠ g(f)

25. f^3can be expressed as:
    a. $f[f^2(x)]$ b. $f[f \times f(x)]$
    c. $f^2[f(x)]$ d. $f[f(x)]$

26. $x + 2y \leq 8$ and $3x - y > 6$ these two inequalities refer to:
    a. Linear inequalities in one variable b. Linear inequalities in two variables
    b. Linear equalities in two variables d. Linear equalities in two variables

27. line of best fit equation is:
    a. $y = a + bx$ b. $y = a + by$
    b. $y = xa + by$ d. $a = y + bx$

28. The other name/s of line of best fit is/are:
    a. Trend Line b. Linear Regression
    b. Curve d. both a and b

29. $y \propto x^2 = - - - -$
    a. $y = kx^2$ b. $y = xk^2$
    b. $y = kxk^2$ d. $x = ky^2$
    (where k is a constant)

30. $if\ x < 0, y > 0$, the values lie in which quadrant?
    a. Quad-I b. Quad-II
    b. Quad-III d. Quad-Iv

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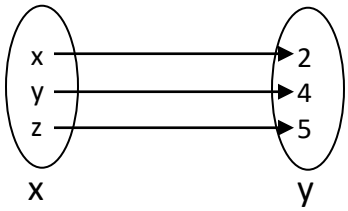
1. State the domain and range for the following relation.

   {(2,a), (4,b), (6,c), (8,d)}

   Domain: {2,4,6,8}
   Range: {a,b,c,d}

2. State whether relation is a function or not?



Not a function as domain ≠ X (domain doesn't contain all elements of X)

Solve the equations (Q3-Q8)

3. $x - 4 = 4$

   $x - 4 = 4$

   $x = 4 - 4$

   $x = 0$

4. $3x = 18$

   $3x = 18$

   Dividing both sides by 3

   $\frac{3x}{3} = \frac{18}{3}$

   $x = 6$

5. $\frac{3}{4}x = 12$

   $\frac{3}{4}x = 12$

   Multiplying by 4 on both sides

   $4 \times \frac{3}{4}x = 4 \times 12$

   $3x = 48$

   Now dividing 3 on both sides to find out x,

   $\frac{3x}{3} = \frac{48}{3}$

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$x = 16$

6. $3(4x - 3) = 2(x - 5)$

$3(4x - 3) = 2(x - 5)$

$12x - 9 = 2x - 10$

$12x - 2x = -10 + 9$

$10x = -1$

$x = \frac{-1}{10}$

7. $\frac{x}{2} - \frac{x}{6} = 15$

$\frac{x}{2} - \frac{x}{6} = 15$

$\frac{3x - x}{6} = 15$

$\frac{2x}{6} = 15$

$6 \times \frac{2x}{6 \times 2} = \frac{15 \times 6}{2}$

$x = 45$

8. $\frac{x}{2} - \frac{x}{6} = \frac{2}{5}$

$\frac{x}{2} - \frac{x}{6} = \frac{2}{5}$

$\frac{3x - x}{6} = \frac{2}{5}$

$\frac{2x}{6} = \frac{2}{5}$

$5 \times 6 \times \frac{2x}{6 \times 2} = \frac{2 \times 6}{2 \times 5}$

$x = \frac{6}{5}$

9. Find value of y when k=2, x=6

$y \propto x$

$y = kx$.....(i)

here y=? when k=2 and x=6

$y = 2 \times 6$

y=12

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Find the missing values of x and y. (Q10-Q13)

10.

x	2	3	5.5	?
y	?	3.6	?	9.6

$y \propto x$

$y = kx$.....(i)

here x=3 when y=3.6

3.6=k(3)

$k=\frac{3.6}{3}$

k=1.2

hence,

y=1.2x

so for x=2 y=1.2(2) y=2.4

for x=5.5 y=1.2(5) y=6.0

for y=9.6 9.6=1.2x x=8

x	2	3	5.5	8
y	2.4	3.6	6	9.6

11.

x	4	5	7	?
y	?	15	?	24

$y \propto x$

$y = kx$.....(i)

here x=5 when y=15

15=k×5

$k=\frac{15}{5}$

k=3

hence,

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$y=3x$

so for x=4 $y=3(4)$ $y=12$
for x=7 $y=3(7)$ $y=21$
for y=24 $24=3x$ $x=8$

x	4	5	7	8
y	12	15	21	24

12.

x	3	5	7	?
y	5	?	?	24

$y \propto x$
$y = kx$.....(i)
here x=3 when y=5
$5=k\times3$
$k=\frac{5}{3}$
hence,
$y=\frac{5}{3}x$

so for x=5 $y=\frac{5}{3}(5)$ $y=\frac{25}{3}$
for x=7 $y=\frac{5}{3}(7)$ $y=\frac{35}{3}$
for y=24 $24=\frac{5}{3}(x)$ $x=\frac{72}{5}$

x	3	5	7	$\frac{72}{5}$
y	5	$\frac{25}{3}$	$\frac{35}{3}$	24

Plot the following regression equations on graph.

13. $\hat{y} = 8 + 0.5x$

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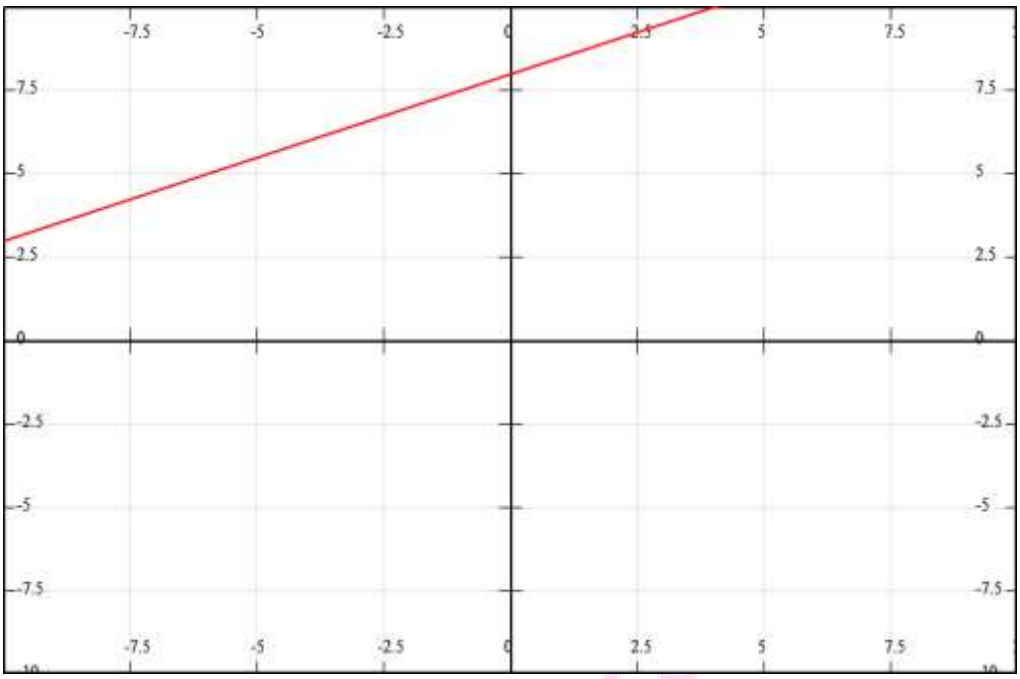

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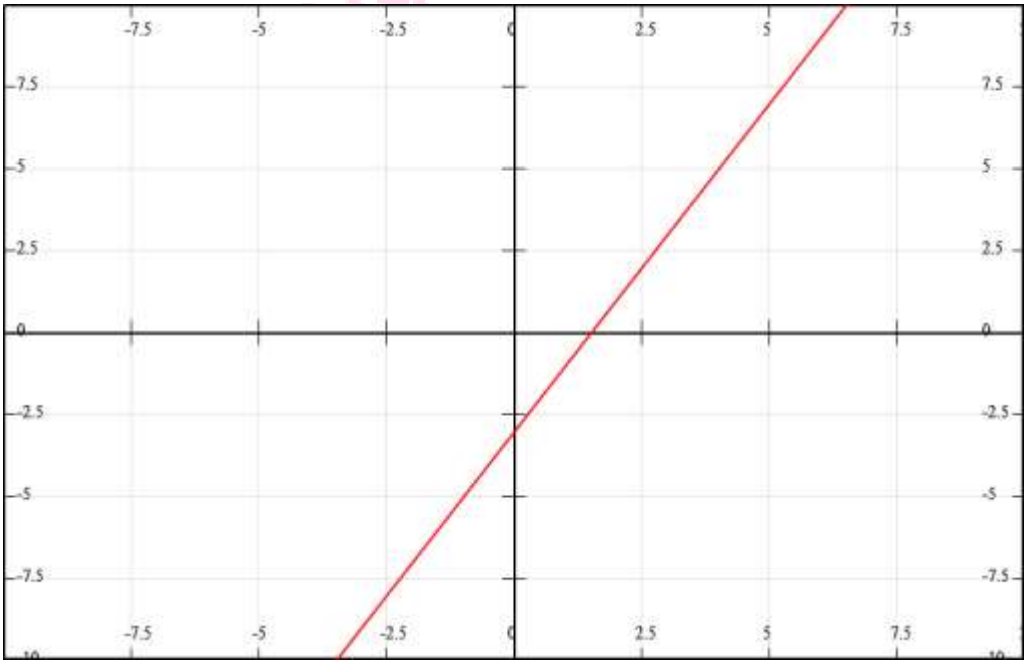

15. **Find the regression lines from following data:**

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$y = a + bx$

$b = \frac{\Sigma xy - \frac{(\Sigma x)(\Sigma y)}{n}}{\Sigma x^2 - \frac{(\Sigma x)^2}{n}}$

$b = \frac{670 - \frac{(68)(50)}{5}}{978 - \frac{(68)^2}{5}}$

$b = \frac{670 - 680}{978 - 924.8}$

$b = \frac{-10}{53.2}$

$b = -0.19$

$\bar{y} = a + b\bar{x}$

$\bar{x} = \frac{\sum x}{n}$

$\bar{x} = \frac{68}{5} = 13.6$

$\bar{y} = \frac{\sum y}{n}$

$\bar{y} = \frac{50}{5} = 10$

$\bar{y} = a + b\bar{x}$

$10 = a + (-0.19)(13.6)$

$a = 12.6$

Hence y=12.6-0.19 *x*

Mark as True or False

16. f(x) = $[x]$ is called absolute value function. (True/False)
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Chooses appropriate answer:

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    a. <>
    b. |■|

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c. $\in$ d. $\emptyset$

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    a. Curve b. V
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