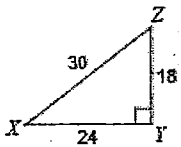


FOUNDATIONS AND PRE-CALCULUS 10

PRACTICE FINAL EXAM

Choose the best answer

1. Determine the trigonometric ratio indicate. Find $\sin X$.



$$\sin X = \frac{O}{H} = \frac{18}{30} = \frac{3}{5}$$

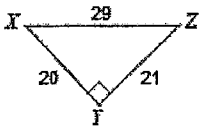
A $\frac{4}{5}$

B $\frac{4}{3}$

C $\frac{3}{5}$

D $\frac{5}{3}$

2. Determine the trigonometric ratio indicate. Find $\tan Z$.



$$\tan Z = \frac{O}{A} = \frac{20}{21}$$

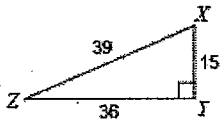
A $\frac{20}{29}$

B $\frac{20}{21}$

C $\frac{21}{20}$

D $\frac{21}{29}$

3. Determine the trigonometric ratio indicate. Find $\cos Z$.



$$\cos Z = \frac{A}{H} = \frac{36}{39} = \frac{12}{13}$$

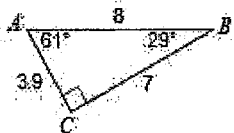
A $\frac{12}{5}$

B $\frac{13}{5}$

C $\frac{5}{12}$

D $\frac{12}{13}$

4. Solve $\triangle ABC$.



$$8^2 = b^2 + 7^2$$

$$64 = b^2 + 49$$

$$\sqrt{15} = \sqrt{b^2}$$

$$\angle B = \cos^{-1}\left(\frac{7}{8}\right)$$

$$= 28.96^\circ$$

$$\angle A = \sin^{-1}\left(\frac{7}{8}\right)$$

$$= 61.04^\circ$$

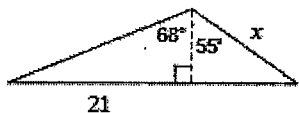
A $\angle B = 29^\circ$, $\angle A = 61^\circ$, $b = 3.9$

C $\angle B = 26.7^\circ$, $\angle A = 63.3^\circ$, $b = 3.9$

B $\angle B = 28.4^\circ$, $\angle A = 61.6^\circ$, $b = 3.9$

D $\angle B = 31.3^\circ$, $\angle A = 58.7^\circ$, $b = 3.9$

5. Determine the length of x to the nearest tenth.



$$y \cdot \tan 68^\circ = \frac{21}{2} \cdot y$$

$$y = \frac{21}{\tan 68^\circ} = 8.485$$

$$x \cdot \cos 55^\circ = \frac{8.485}{\cos 55^\circ} \cdot x$$

$$x = \frac{8.485}{\cos 55^\circ} = 14.792$$

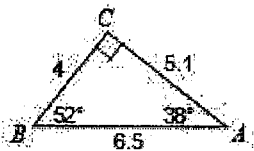
A 13.4

B 14.8

C 17.6

D 14.5

6. Solve $\triangle ABC$.



$$\angle B = 180^\circ - 90^\circ - 38^\circ$$

$$\angle B = 52^\circ$$

$$\tan 38^\circ = \frac{y}{6}$$

$$b = \frac{y}{\tan 38^\circ}$$

$$b = 6.119$$

$$\sin 38^\circ = \frac{y}{c}$$

$$c = \frac{y}{\sin 38^\circ}$$

$$c = 6.497$$

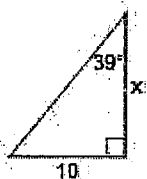
A $\angle B = 52^\circ$, $b = 5.7$, $c = 6.5$

C $\angle B = 52^\circ$, $b = 5.1$, $c = 6.8$

B $\angle B = 52^\circ$, $b = 5.1$, $c = 7.9$

D $\angle B = 52^\circ$, $b = 5.1$, $c = 6.5$

7. Determine the measure of the side indicated to the nearest tenth.



$$\tan 39^\circ = \frac{10}{x}$$

$$x = \frac{10}{\tan 39^\circ} \quad x = 12.349$$

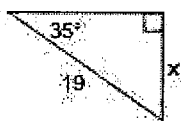
A 8.1

B 8.8

C 12.3

D 8.6

8. Determine the measure of the side indicated to the nearest tenth.



$$\sin 35^\circ = \frac{x}{19}$$

$$x = \sin 35^\circ \cdot 19 = 10.894$$

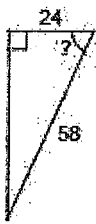
A 10.9

B 36.3

C 11.8

D 33.1

9. Determine the measure of the angle indicated to the nearest degree.



$$\theta = \cos^{-1}\left(\frac{24}{58}\right)$$

$$\theta = 65.56^\circ$$

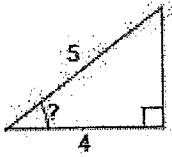
A 68°

B 24°

C 22°

D 66°

10. Determine the measure of the angle indicated to the nearest degree.



$$\theta = \cos^{-1}\left(\frac{4}{5}\right) = 36.87^\circ$$

- A 36° **(B)** 37° C 39° D 53°

11. Expand and simplify: $(6x + 1)(4x - 8) = 24x^2 - 48x + 4x - 8 = 24x^2 - 44x - 8$

- A $24x^2 - 8$ **(C)** $24x^2 - 44x - 8$
 B $24x^2 + 52x + 8$ D $24x^2 - 52x + 8$

12. Expand and simplify: $(7x + 6)(3x + 5) = 21x^2 + 35x + 18x + 30 = 21x^2 + 53x + 30$

- (A)** $21x^2 + 53x + 30$ C $24x^2 + 52x + 28$
 B $10x^2 + 53x + 30$ D $21x^2 + 53x + 35$

13. Expand and simplify: $(4x - 11)^2 = (4x - 11)(4x - 11) = 16x^2 - 44x - 44x + 121 = 16x^2 - 88x + 121$

- A $16x^2 + 121$ C $16x^2 - 88x - 121$
 B $16x^2 - 121$ **(D)** $16x^2 - 88x + 121$

14. Expand and simplify: $(3m + 1)(3m^2 + 2m - 7) = 9m^3 + 6m^2 - 21m + 2m^2 + 2m - 7 = 9m^3 + 9m^2 - 19m - 7$

- A $49m^3 + 42m^2 - 2m + 16$ **(C)** $9m^3 + 9m^2 - 19m - 7$
 B $21m^3 + 55m^2 + 17m + 7$ D $6m^3 - 44m^2 - 28m - 7$

15. Expand and simplify: $(3a^2 + 6a - 3)(8a + 8) = 24a^3 + 24a^2 + 48a^2 + 48a - 24a - 24 = 24a^3 + 72a^2 + 24a - 24$

- A $24a^3 + 10a^2 - 26a + 10$ **(C)** $24a^3 + 72a^2 + 24a - 24$
 B $24a^3 - 60a^2 + 40a - 24$ D $24a^3 - 46a^2 + 39a - 56$

16. Expand and simplify: $-4(2 - 7x) - (3x - 5)^2 = -8 + 28x - (3x - 5)(3x - 5)$

- (A)** $-9x^2 + 58x - 33$ C $-9x^2 - 16x + 17$ $= -8 + 28x - (9x^2 - 30x + 25)$
 B $-9x^2 - 2x - 33$ D $-9x^2 + 14x - 33$ $= -9x^2 + 58x - 33$

17. Factor: $18m^6 + 3m^5 - 12m^4$ GCF = $3m^4$

- A $3m^5(6m^3 + m - 4)$ C $3m^5(m^2 + m - 4)$
(B) $3m^4(6m^2 + m - 4)$ D $m^3(6m^2 + m - 4)$

18. Factor: $-16x^2y^2 + 36xy^3 + 28x^3y^3$ $GCF = -4xy^2$

- A $4xy^2(4x - 9y - 7x^2y)$ C $4xy^2(-4x + 9y + 7x^2y)$
 B $-4xy^2(4x + 9y + 7x^2y)$ (D) $-4xy^2(4x - 9y - 7x^2y)$

19. Factor: $a^2 + a - 30$

$6x(-5) = -30$ $a^2 + 6a - 5a - 30$
 $6 + (-5) = 1$ $a(a+6) - 5(a+6)$ $(a+6)(a-5)$
 C $(a+5)(a-6)$
 D $(a-8)(a+7)$

- A $2(a-2)(a+10)$
 (B) $(a-5)(a+6)$

20. Factor: $x^2 - 9x + 20$

$-4 \times (-5) = 20$ $x^2 - 4x - 5x + 20$
 $-4 + (-5) = -9$ $x(x-4) - 5(x-4)$
 C $(x-9)(x-3)$ $(x-4)(x-5)$
 D $(x-9)(x-8)$

- A $(x+4)(x-5)$
 (B) $(x-4)(x-5)$

21. Factor: $2x^2 - 19x + 24$

$-16 \times (-3) = 48$ $2x^2 - 16x - 3x + 24$
 $-16 + (-3) = -19$ $2x(x-8) - 3(x-8)$
 (C) $(2x-3)(x-8)$ $(x-8)(2x-3)$
 D $(2x-3)(x+8)$

- A $5(2x+1)(x-9)$ $(2)(14) = 28$
 B $2(x-3)(x-4)$

22. Factor: $16x^2 + 40x + 25$ perfect square trinomial.

- A $(16x+25)^2$ C $(4x-5)(4x+5)$
 B $(4x-5)^2$ (D) $(4x+5)^2$

23. Factor: $9n^2 - 30n + 25$

perfect square trinomial

- A $(3n+25)^2$ C $(3n-5)(3n+5)$
 B $(3n+5)^2$ (D) $(3n-5)^2$

24. Factor: $x^2 - 256$ Difference of squares

- A $(x+16)^2$ (C) $(x+16)(x-16)$
 B $(x-16)^2$ D $(x+16)(x+4)(x-4)$

25. Identify the polynomial $x^2 + 16$ as perfect square trinomial, difference of squares, or neither.

- A perfect square trinomial B difference of squares (C) neither

26. Write $5^{\frac{6}{7}}$ in radical form.

- A $\sqrt[6]{5^7}$ (B) $(\sqrt[7]{5})^6$ C $7\sqrt{5^6}$ D $(\sqrt[6]{42})^7$

27. Evaluate $216^{\frac{1}{3}}$ without a calculator.

$$(\sqrt[3]{216})^1 = 6$$

- A 72 B $\frac{1}{216}$ **C 6** D -6

28. Evaluate $16^{-\frac{3}{4}}$

$$(\sqrt[4]{16})^3 = \frac{1}{2^3} = \frac{1}{8}$$

- A -8 **B $\frac{1}{8}$** C $\frac{1}{2}$ D 2

29. Simplify $(3a^2)^3(4a^3)^0$. Write with positive exponents

$$(3a^2)^3 = 3^3 a^6 = 27a^6$$

- A $9a^6$ **B $27a^6$** C $36a^8$ D $108a^9$

30. Simplify $\sqrt{x^3} \div \sqrt[3]{x^4}$. Write with positive exponents

$$\frac{x^{\frac{3}{2}}}{x^{\frac{4}{3}}} = x^{\frac{3}{2} - \frac{4}{3}} = x^{\frac{9}{6} - \frac{8}{6}} = x^{\frac{1}{6}}$$

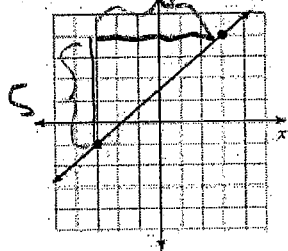
- A $\sqrt[6]{x}$** B $\sqrt[8]{x^9}$ C $\sqrt[2]{x^8}$ D $\sqrt[12]{x}$

31. Simplify $(\frac{125x^a}{125x^3})^3$. Write with positive exponents

$$(\frac{1x^{a-3}}{5})^3 = \frac{x^{3a-9}}{125}$$

- A $\frac{x^{3a-9}}{125}$** B $\frac{x^{a-3}}{5}$ C $125x^{3a-9}$ D $\frac{x^{27a}}{5}$

32. Determine the slope of the segment

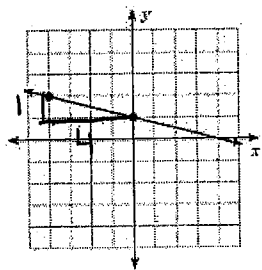


rise = 5
run = 6

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

- A $-\frac{6}{5}$ **B $\frac{5}{6}$** C $-\frac{5}{6}$ D $\frac{6}{5}$

33. Determine the slope of the segment.



rise = -1
run = 4

slope = $-\frac{1}{4}$

- A 4 B -4 C $\frac{1}{4}$ **D $-\frac{1}{4}$**

34. Determine the slope of a line passing through $(10, -8)$ and $(16, 18)$. $m = \frac{18 - (-8)}{16 - 10} = \frac{26}{6} = \frac{13}{3}$

A $\frac{3}{13}$ **B $\frac{13}{3}$** C $-\frac{13}{3}$ D $-\frac{3}{13}$

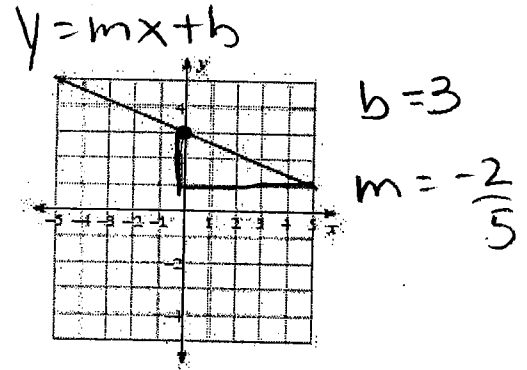
35. Determine the slope of a line passing through $(-5, 20)$ and $(-11, -8)$. $m = \frac{-8 - 20}{-11 - (-5)} = \frac{-28}{-6} = \frac{14}{3}$

A $\frac{3}{14}$ B $-\frac{14}{3}$ **C $\frac{14}{3}$** D $-\frac{3}{14}$

36. What is the equation of the line?

A $y = 3x - \frac{2}{5}$
 B $y = \frac{2}{5}x + 3$

C $y = -\frac{2}{5}x + 3$
 D $y = -3x - \frac{2}{5}$



37. Write the equation of a line with a slope of $\frac{2}{3}$ and a y-intercept of -2 .

A $y = \frac{2}{3}x - 2$
 B $y = -\frac{2}{3}x - 2$

C $y = x - \frac{2}{3}$
 D $y = -2x - \frac{2}{3}$

$y = mx + b$
 $m = \frac{2}{3}$ $b = -2$

38. Write the equation of a line with a slope of $-\frac{7}{4}$ and passes through $(4, -2)$.

A $y + 2 = -\frac{7}{4}(x - 4)$
 B $y - 4 = x + 2$

C $y + 2 = (x - 4)$
 D $y - 4 = -\frac{7}{4}(x + 2)$

$y - y_1 = m(x - x_1)$
 $y - (-2) = -\frac{7}{4}(x - 4)$

39. Write the equation of a line in slope-intercept form that passes through $(3, -1)$ and $(-5, 2)$.

A $y = -\frac{3}{8}x + \frac{1}{8}$
 B $y = -\frac{1}{4}x - \frac{3}{8}$

~~C $y = \frac{1}{4}x - \frac{3}{8}$~~
~~D $y = \frac{1}{8}x - \frac{3}{8}$~~

$m = \frac{2 - (-1)}{-5 - 3} = \frac{3}{-8}$
 $y - (-1) = \frac{-3}{8}(x - 3)$
 $y + 1 = \frac{-3x + 9}{8}$
 $y = \frac{-3x + 9}{8} - 1 = \frac{-3x + 9 - 8}{8} = \frac{-3x + 1}{8}$

40. Write the equation of a line in point slope form that passes through $(-5, 1)$ and is parallel to $y = \frac{4}{5}x + 4$

A $y + 5 = 3(x - 1)$
B $y - 1 = \frac{4}{5}(x + 5)$

C $y - 1 = -\frac{5}{4}(x + 5)$
 D $y + 5 = \frac{4}{5}(x - 1)$

$m = \frac{4}{5}$
 $y - 1 = \frac{4}{5}(x - (-5))$

41. Write the equation of a line in point slope form that passes through $(4, -1)$ and is perpendicular to $y = \frac{3}{2}x - 4$

A $y + 4 = -\frac{2}{3}(x + 1)$

B $y - 4 = \frac{3}{2}(x + 1)$

C $y + 1 = -\frac{2}{3}(x - 4)$

D $y + 1 = \frac{3}{2}(x - 4)$

$y - (-1) = -\frac{2}{3}(x - 4)$

$y + 1 = -\frac{2}{3}(x - 4)$

$m_1 = \frac{3}{2}$

$m_2 = -\frac{2}{3}$

42. Write the equation in general form: $y - 3 = \frac{1}{7}(x + 2)$

A $x + 7y - 23 = 0$

B $x - 7y + 23 = 0$

C $2x + 21y - 7 = 0$

D $5x - 21y + 7 = 0$

$y - 3 = \frac{1}{7}x + \frac{2}{7}$

$7(y) - 7(3) = 7(\frac{1}{7}x) + 7(\frac{2}{7})$

$7y - 21 = x + 2$

$0 = x - 7y + 23$

43. Write the equation in general form: $y - 3 = 8(x - 1)$

A $x - 8y - 8 = 0$

B $x + 8y - 5 = 0$

$y - 3 = 8x - 8$

$0 = 8x - y - 5$

C $8x - y - 5 = 0$

D $x + 8y + 8 = 0$

44. Determine the slope of the line: $3x + 2y = -14$

A $-\frac{5}{2}$

B $\frac{3}{2}$

C $\frac{5}{2}$

$2y = -3x - 14$

D $-\frac{3}{2}$

$y = -\frac{3}{2}x - \frac{14}{2}$

45. Write the equation in slope intercept form: $y + 4 = -(x + 4)$

A $y = -3x - 8$

B $y = -x - 8$

C $y = 3x - 8$

D $y = x - 8$

$y + 4 = -x - 4$

$y = -x - 8$

46. Write the equation in slope intercept form: $13x - 6y + 36 = 0$

A $y = \frac{1}{3}x + 6$

B $y = -\frac{13}{6}x + 6$

C $y = -\frac{5}{3}x + 6$

D $y = \frac{13}{6}x + 6$

$-\frac{6y}{-6} = -\frac{13x}{-6} - \frac{36}{-6}$

$y = \frac{13}{6}x + 6$

47. Solve the system by substitution.

A $(-8, 1)$

B $(1, -8)$

C $(-1, 8)$

D $(8, -1)$

① $7x + 3y = 17$

② $x + y = 7$

① $x = 7 - y$

② $7(7 - y) + 3y = 17$

$49 - 7y + 3y = 17$

$-4y = -32$

$y = 8$

$x = 7 - 8$

$x = -1$

48. Solve the system by substitution.

A $(-1, -1)$

B $(1, 1)$

C $(1, -1)$

D infinite number of solutions

① $-4 + 2y = -6x$

② $-2x + 3 = -y$

② $2x - 3 = y$

① $-4 + 2(2x - 3) = -6x$

$-4 + 4x - 6 = -6x$

$-10 = -10x$

$1 = x$

$y = 2(1) - 3$
 $y = -1$

49. Solve the system by elimination.

A (4, -4)

B (9, -4)

C (4, 4)

D (9, 4)

① $-6x + 10y = 16$
 ② $-5(-9x + 2y = -28)$

① $-6x + 10y = 16$
 ② $45x - 10y = 140$

$39x = 156$
 $x = 4$

$-6(4) + 10y = 16$
 $-24 + 10y = 16$
 $10y = 40$
 $y = 4$

50. Solve the system by elimination.

$4 = -3x + 2y$
 $12 = 3x - 6y$

$4 = -3x + 2y$
 $-3x + 6y + 12 = 0$

A (1, -4)

B (-4, -1)

C (-4, 4)

D (-4, -4)

$16 = -4y$ $y = -4$

$4 = -3x + 2(-4)$
 $4 = -3x - 8$
 $12 = -3x$
 $-4 = x$

51. Determine the number of solutions for the linear system:

① $8y = 16x + 7$
 $y = 2x + \frac{7}{8}$

② $-4y = -8x - 8$
 $y = 2x + 4$

① $-16x + 8y = 7$
 ② $8x - 4y = -8$

A one solution

B no solution

C two solutions

D infinite number of solutions

same slope

52. Determine the number of solutions for the linear system:

① $2y = -16x + 30$
 $y = -8x + 15$

② $3y = -24x + 45$
 $y = -8x + 15$

① $16x + 2y = 30$
 ② $24x + 3y = 45$

A one solution

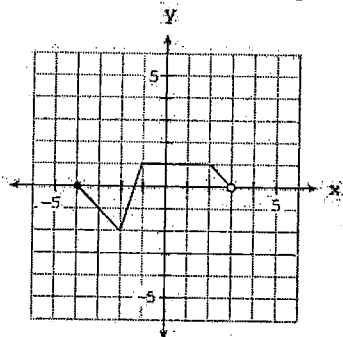
B no solution

C two solutions

D infinite number of solutions

same slope, same y-intercept
 same line.

53. Determine the range of the relation.



y-values

Range

A $-4 \leq x < 3$

B $-2 \leq x \leq 1$

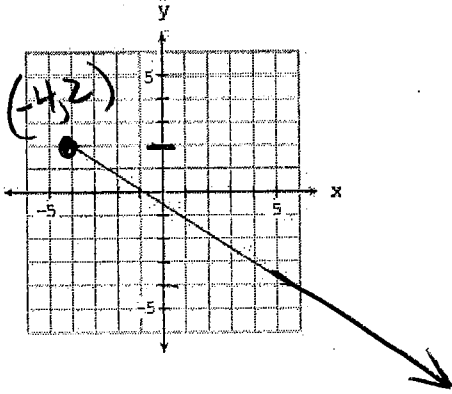
C $-2 \leq y \leq 1$

D $-4 < x \leq 3$

The Domain would be $-4 \leq x < 3$

54. Determine the range of the relation.

y-values



A $y \in \mathbb{R}$

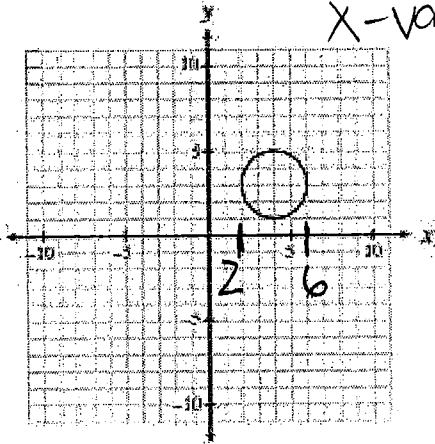
B $y \leq 2$

C $y \geq -4$

D $y \geq 2$

55. Determine the domain of the relation.

x-values



A $1 \leq y \leq 5$

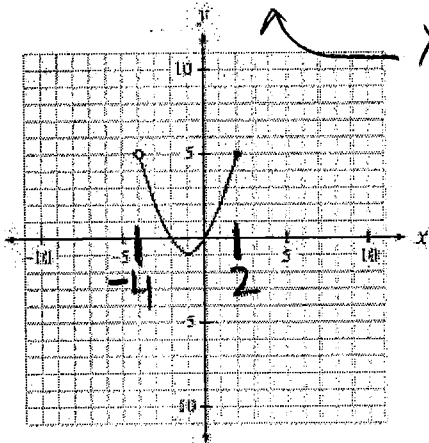
B $1 < y < 5$

C $2 \leq x \leq 6$

D $2 < x < 6$

56. Determine the domain of the relation

x-values



Open circle at $x = -4$

A $-1 < y \leq 5$

B $-1 \leq y < 5$

C $-4 < x \leq 2$

D $-4 \leq x < 2$

57. Which ordered pair is represented by $f(x) = -5$?

A $(-5, 3)$

B $(-3, 5)$

C $(3, -5)$

D $(5, -3)$

58. The cost of renting C (in dollars) of the room for the prom is modeled by the formula $C(n) = 500 + 4n$, where n is the number of students who will attend the ball. Calculate the cost of renting the room if 70 students attend the ball.

A \$108

B \$500

C \$780

D \$970

$$C(70) = 500 + 4(70)$$

$$C(70) = 500 + 280$$

$$C(70) = 780$$

59. Given the function $f(x) = 11 - 8x$, determine $f(-19)$.

A 163

B -141

C -57

D -57

$$f(-19) = 11 - 8(-19)$$

$$f(-19) = 11 + 152$$

$$f(-19) = 163$$

60. Given the function $g(x) = \frac{3}{4}x - 12$, determine the value of x when $g(x) = -63$.

A -100

B -68

C -38.25

D 68

$$-63 = \frac{3}{4}x - 12$$

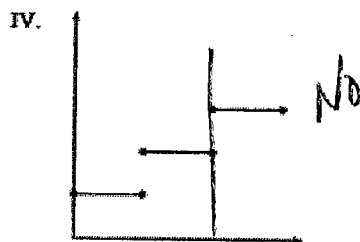
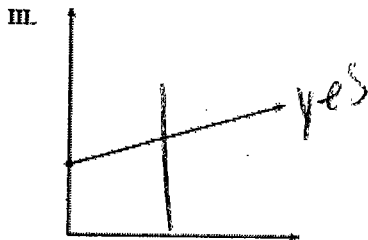
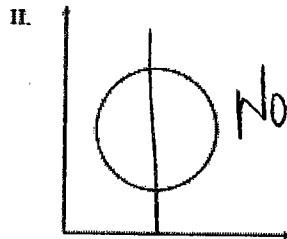
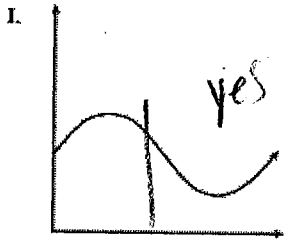
$$4(-51) = (3x)$$

$$-204 = 3x$$

$$\frac{-204}{3} = x$$

$$-68 = x$$

61. Which relations are functions?



A only III

B only I and III

C only II and IV

D only I, III and IV

62. Given the arithmetic sequence: $-91, -114, -137, \dots$; determine t_{47} .

A -1172

B -1149

C -68

D -4209

$$t_1 \quad d = -114 - (-91) = -23$$

$$t_{47} = -91 + (47-1)(-23)$$

$$t_{47} = -91 + 46(-23)$$

$$t_{47} = -91 - 1058$$

$$t_{47} = -1149$$

63. Determine the rank of the term for the sequence.

157 is the n^{th} term of $-14, -11, -8, \dots$

A t_{57}

B t_{47}

C t_{58}

D t_{171}

$$t_n = 157$$

find n

$$157 = -14 + (n-1)(3)$$

$$157 = -14 + 3n - 3$$

$$157 = 3n - 17$$

$$174 = 3n$$

$$n = \frac{174}{3} = 58$$