

MOCK Final Exam Pre-Calc 11

Multiple Choice

Identify the choice that best completes the statement or answers the question.

1. Which of the following numbers occurs in the sequence $-12, -8, -4, 0, 4, \dots$? $8, 12, 16, 20, 24$

A 6
 B -3
 C 24
 D 15

2. The common difference in the arithmetic sequence $2, -6, -14, -22, \dots$ is

A -8
 B -3
 C -16
 D 8

3. In the formula for the general term of an arithmetic sequence $t_n = -7 + (n-1) \times (-2.5)$, the common difference is

A 17.5
 B -7
 C -4.5
 D -2.5

4. Which of the given formulas for the general term of the sequence $-9, -1, 7, 15, 23, \dots$ is correct?

A $t_n = -8n - 17$
 B $t_n = 8n - 17$
 C $t_n = 8n - 1$
 D $t_n = -8n - 1$

5. The sum of the series $(-5) + (-7) + (-9) + \dots + (-19)$ is # of terms is 8

A -96
 B -304
 C -192
 D 26

6. The sum of an arithmetic series where $t_1 = -2, t_3 = 7$, and $n = 15$ is Common Diff is $\frac{4.5}{5}$

A -502.5
 B 442.5
 C 476.25
 D 885

7. The common ratio for the geometric sequence $8, 1, 0.125, 0.015625, \dots$ is

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

2nd term = $\frac{1}{8}$
 First term = 8

8. The 6th term in the sequence $\frac{4}{7}, 1, \frac{7}{4}, \frac{49}{16}, \dots$ is

A $\frac{2401}{4096}$
 B $\frac{2401}{256}$
 C $\frac{256}{2401}$
 D $\frac{117649}{4096}$

9. What is the value of S_9 for the series $8 - 24 + 72 - 216 + \dots$? $QR1 - 3$

A 39 366
 B -13 122
 C 52 491
 D 39 368

$$\#5 \quad t_n = a + (n-1)d$$

$$-19 = -5 + (n-1)(-2)$$

$$-19 = -5 - 2n + 2$$

$$\begin{array}{r} -19 = -3 - 2n \\ +3 \quad +3 \end{array}$$

$$-16 = -2n \quad n = 8$$

$$S_8 = \frac{8}{2} [2(-5) + (8-1)(-2)]$$

$$4 [-10 + -14]$$

$$4 [-24] = -96$$

$$\#6 \quad S_n = \frac{15}{2} [2(-2) + (15-1)4.5]$$

$$7.5 [-4 + 63]$$

$$7.5 [59] = 442.5$$

Common Difference is 4.5

$$-2 \rightarrow 7 = \frac{9}{2} = 4.5$$

#8

$$\frac{1}{\frac{4}{7}} = \frac{7}{4}$$

$$a_n = ar^{n-1}$$

$$a_6 = \left(\frac{4}{7}\right) \left(\frac{7}{4}\right)^{6-1}$$

$$a_6 = \frac{4}{7} \left(\frac{7}{4}\right)^5$$

$$a_6 = \frac{\cancel{4} \cancel{7} \cancel{7} \cancel{7} \cancel{7} \cancel{7}}{\cancel{7} \cancel{4} \cancel{4} \cancel{4} \cancel{4} \cancel{4}}$$
$$= \frac{2401}{256}$$

Name: _____

$$S_{\infty} = \frac{t_1}{1-r}$$

$$\frac{15}{1-\frac{8}{9}} = \frac{15}{\frac{1}{9}} = 135$$

ID: A 135

10. What is the sum of the infinite geometric series $15 + 15(8/9) + 15(8/9)^2 + 15(8/9)^3 + \dots$?

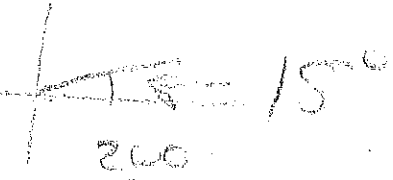
- A -120
- B $\frac{135}{17}$

- C $\frac{135}{8}$
- D 135**

11. What is the reference angle for 15° in standard position?

- A 255°
- B 30°

- C 345°
- D 15°**



12. What is the reference angle for 200° in standard position?

- A 100°
- B 70°

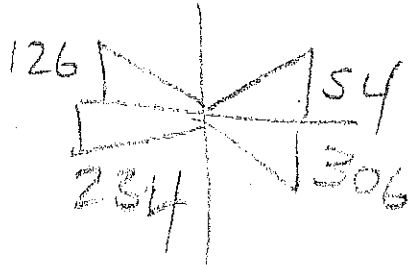
- C 20°
- D 110°**



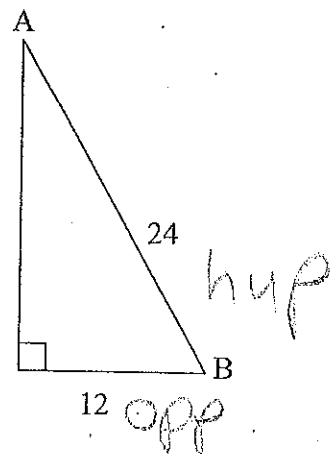
13. What are the three other angles in standard position that have a reference angle of 54° ?

- A $99^\circ, 144^\circ, 234^\circ$
- B $108^\circ, 162^\circ, 216^\circ$

- C $144^\circ, 234^\circ, 324^\circ$
- D $126^\circ, 234^\circ, 306^\circ$**



14. What is the exact sine of $\angle A$?



$$\sin \theta = \frac{12}{24} = \frac{1}{2}$$

- A $1/\sqrt{3}$
- B $1/3$

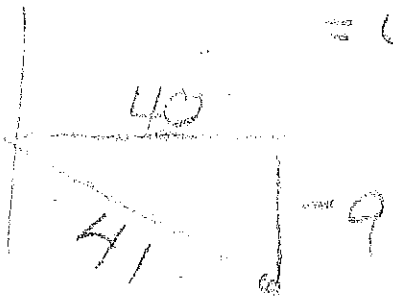
- C $2/\sqrt{3}$
- D $1/2$**

15. The point $(40, -9)$ is on the terminal arm of $\angle A$. Which is the set of exact primary trigonometric ratios for the angle?

- A $\sin A = \frac{41}{9}, \cos A = \frac{41}{40}, \tan A = -\frac{9}{40}$
- B $\sin A = \frac{40}{41}, \cos A = -\frac{9}{41}, \tan A = -\frac{40}{9}$
- C $\sin A = -\frac{40}{41}, \cos A = \frac{9}{41}, \tan A = -\frac{9}{40}$
- D $\sin A = -\frac{9}{41}, \cos A = \frac{40}{41}, \tan A = -\frac{9}{40}$**

$$40^2 + (-9)^2 = \sqrt{1681}$$

$$= 41$$



Name: _____

ID: A

16. Determine, to the nearest tenth of a centimetre, the two possible lengths of a .

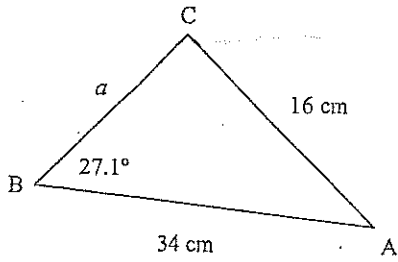


Diagram not drawn to scale.

A 72.8 cm and 26.3 cm

B 34.3 cm and 26.3 cm.

C 72.8 cm and 55.8 cm

D 55.8 cm and 34.3 cm

17. Determine, to the nearest tenth of a degree, the two possible measures of $\angle C$.

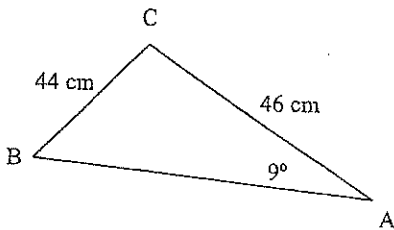


Diagram not drawn to scale.

A 9° and 81°

B 161.6° and 171°

C 161.6° and 0.4°

D 9° and 171°

Name: _____

ID: A

18. Determine the measure of x , to the nearest tenth of a degree.

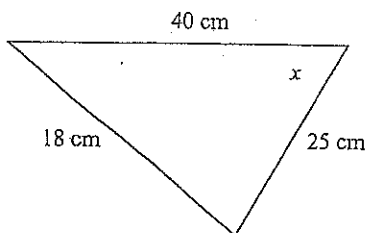


Diagram not drawn to scale.

- A 25.6° C 136.3°
B 18.1° D 71.9°

19. What is the length of x , to the nearest tenth of a metre?

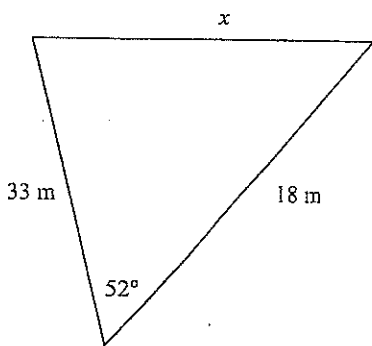


Diagram not drawn to scale.

- A 27.7 m C 26.1 m
B 21.8 m D 37.6 m

20. What is the vertex of $y = 7(x+5)^2 + 4$?

- A (5, 4)
B (-4, 5)

- C (-5, 4)
D (7, -4)

↑ ↑
P backwards
left or right

up or down

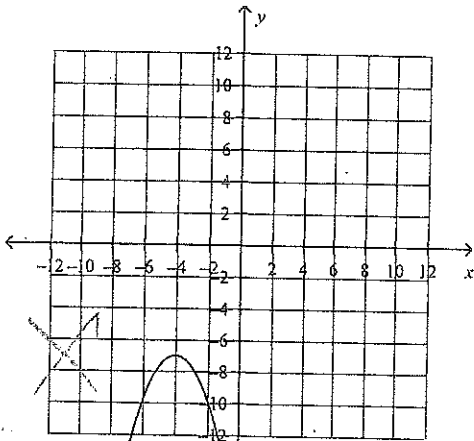
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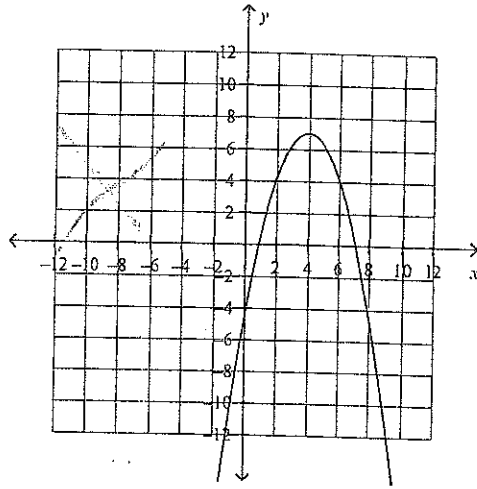
Factor up → *+4, -7*

21. Which graph represents the quadratic function $y = \frac{5}{7}(x-4)^2 - 7$?

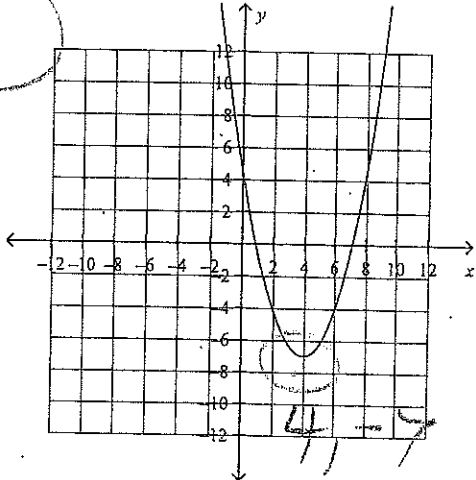
A



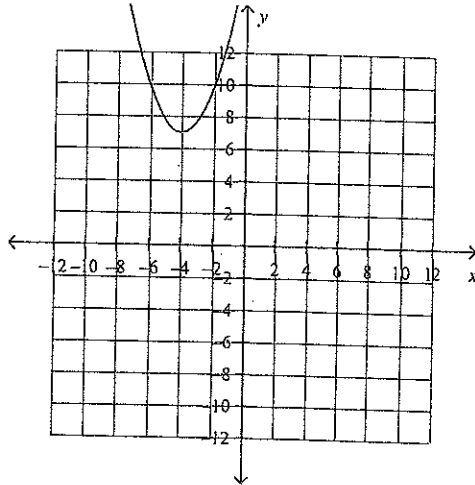
C



B



D



22. What are the domain and range of $y = 7(x-1)^2 - 9$?

A Domain: $\{x | x \leq -1, x \in R\}$

Range: $\{y | y \in R\}$

B Domain: $\{x | x \in R\}$

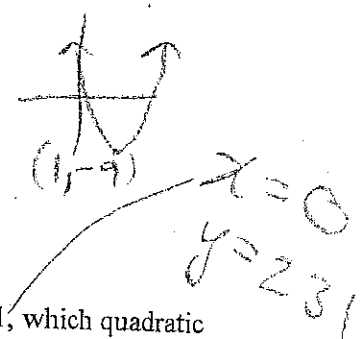
Range: $\{y | y \geq -9, y \in R\}$

C Domain: $\{x | x \geq 7, x \in R\}$

Range: $\{y | y \in R\}$

D Domain: $\{x | x \in R\}$

Range: $\{y | y \leq -1, y \in R\}$



23. The vertex of a parabola is located at $(-5, 6)$. If the parabola has a y -intercept of 231, which quadratic function represents the parabola?

A $f(x) = 9(x-5)^2 + 6$

B $f(x) = 9(x+5)^2 + 6$

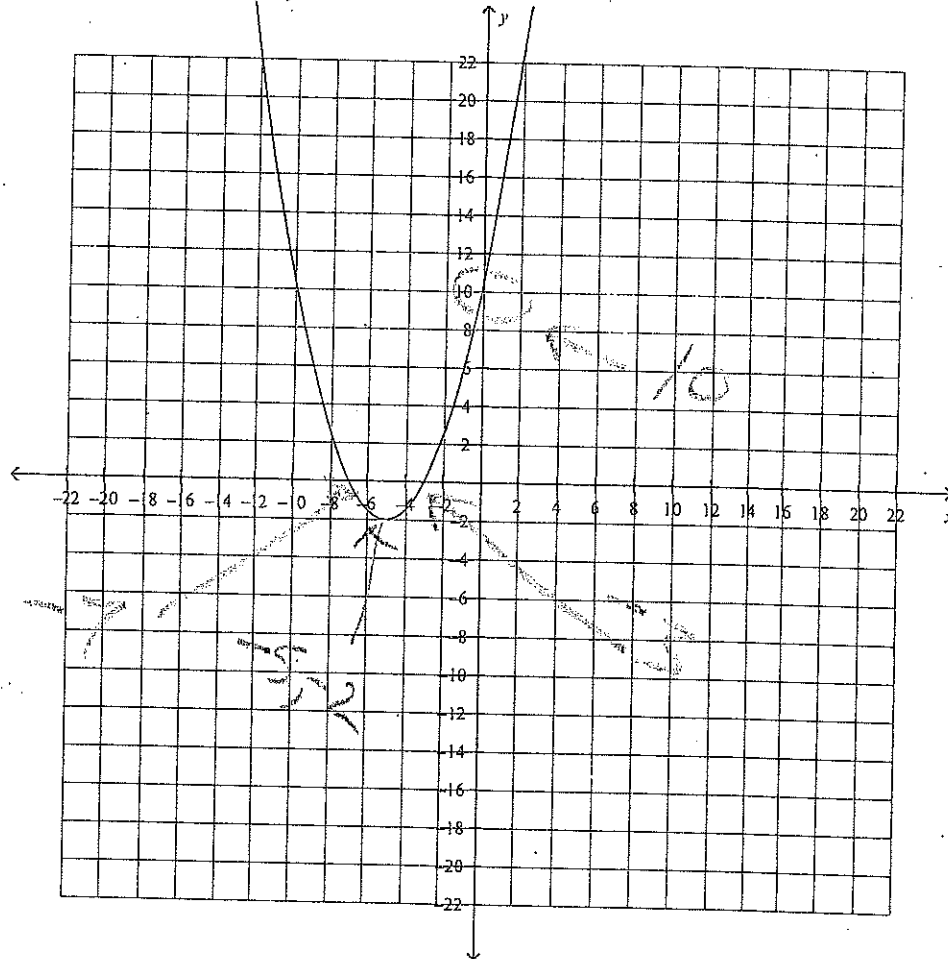
C $f(x) = -9(x+5)^2 + 6$

D $f(x) = 9(x-5)^2 - 6$

$y = a(x-p)^2 + q$
 $231 = 25a + 6$
 $-6 \quad -6$
 $225 = 25a$

$231 = a(0+5)^2 + 6$
 $a = 9$
 $y = 9(x+5)^2 + 6$

24. Identify the characteristics of this graph.



- ~~A~~ vertex: $(-2, -5)$
- ~~axis of symmetry: $x = -2$~~
- ~~y-intercept: 10.5~~
- ~~x-intercepts: -3 and -7~~
- ~~opens downward~~

- B vertex: $(-5, -2)$
- axis of symmetry: $x = -5$
- y-intercept: 10.5
- x-intercepts: -3 and -7
- opens upward

- C vertex: $(-2, -5)$
- axis of symmetry: $x = -2$
- y-intercept: 10.5
- x-intercepts: -3 and -7
- opens upward

- D vertex: $(-5, -2)$
- axis of symmetry: $x = -2$
- y-intercept: 10.5
- x-intercepts: 3 and 7
- opens downward

25. What is the function $y = (x+2)^2$ written in standard form?

- A $y = x^2 + 4x + 4$
- ~~B $y = x^2 - 4x + 4$~~

- ~~C $y = x^2 - 2^2$~~
- ~~D $y = x^2 + 4$~~

$$(x+2)(x+2)$$

$$x^2 + 4x + 4$$

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complete the square

$$y = (x^2 + 24x + 144) - 144 + 29$$

$$y = (x + 12)^2 - 115$$

ID: A

26. What is the equation of the quadratic function $y = x^2 + 24x + 29$ in vertex form?

A $y = (x + 12)^2 - 173$
 B $y = (x - 12)^2 - 115$
 C $y = (x - 12)^2 - 173$
 D $y = (x + 12)^2 - 115$

27. State whether the function $y = 4x^2 - 36x - 43$ has a maximum or minimum value and identify the coordinates of the vertex.

A maximum at (4.5, -124)
 B maximum at (-124, 4.5)
 C minimum at (-124, 4.5)
 D minimum at (4.5, -124)

28. What are the roots of the quadratic function $y = 0.5x^2 + 3.5x + 6$?

A -0.125
 B 4 and 3
 C -4 and -3
 D -6

$x^2 + 7x + 12$
 $(x + 4)(x + 3)$

29. What are the roots of the quadratic function $y = -6.1x^2 - 97.6x - 390.4$?

A -8 and 0
 B -390.4 and 8
 C -8
 D 8

$97.6 \pm \sqrt{9526.76 - 9526.76}$
 266.1

30. Factor $x^2 - 20x + 75$ completely.

A $(x - 5)(x + 15)$
 B $(x + 5)(x + 15)$
 C $(x + 5)(x - 15)$
 D $(x - 5)(x - 15)$

15, 5
 -15, 5

31. Factor $-4x^2 + 68x - 120$ completely.

A $-4(x - 2)(x - 15)$
 B $-4(x + 2)(x + 15)$
 C $-4(x + 2)(x - 15)$
 D $-4(x - 2)(x + 15)$

$-4(x^2 - 17x + 30)$

32. Solve $-8x^2 + 120x + 432 = 0$.

A $x = 18$ and $x = -3$
 B $x = -18$ and $x = 3$
 C $x = \frac{9}{4}$ and $x = -\frac{3}{8}$
 D $x = -144$ and $x = 24$

$-8(x^2 - 15x - 54)$

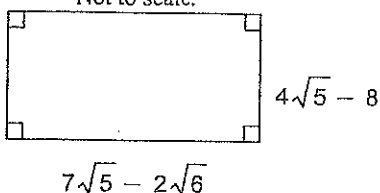
15, -2
 18, 3

33. Determine the roots of the quadratic equation $-5x^2 + 55x = 50$.

A $x = -10$ and $x = -1$
 B $x = -50$ and $x = -5$
 C $x = 10$ and $x = 1$
 D $x = 2$ and $x = \frac{1}{5}$

$-5x^2 + 55x - 50 = 0$
 $-5(x^2 - 11x + 10)$
 $(x - 10)(x - 1)$
 $x = 10, 1$

34. Find a simplified expression for the perimeter of this shape.



$$4\sqrt{5} - 8 + 4\sqrt{5} - 8 + 7\sqrt{5} - 2\sqrt{6} + 7\sqrt{5} - 2\sqrt{6}$$

$$22\sqrt{5} - 4\sqrt{6} - 16$$

A $44\sqrt{5} - 8\sqrt{6} - 32$

B $22\sqrt{5} - 4\sqrt{6} - 16$

C $12\sqrt{2} + 4\sqrt{3} + 4$

D $4\sqrt{6} + \sqrt{3} - 8 - \sqrt{2}$

35. Express $\sqrt[5]{64n^{10}m^{15}}$ in simplified form.

A $4n^2m^3(\sqrt[5]{4})$

B $2n^3m^2(\sqrt[5]{5})$

C $4n^2m^3(\sqrt[5]{2})$

D $2n^2m^3(\sqrt[5]{2})$

36. Simplify $3\sqrt{175} + 6\sqrt{63}$.

A $9 + \sqrt{238}$

B $33\sqrt{7}$

C $9 + 2\sqrt{2}$

D 114

37. Express $(\sqrt{19} - \sqrt{7})(\sqrt{19} + \sqrt{7})$ in simplest form.

A $2\sqrt{19} - 19\sqrt{7}$

B $2\sqrt{3}$

C 12

D $2\sqrt{19} - 2\sqrt{7}$

38. The non-permissible value(s) for the rational expressions $\frac{12}{x^2 - 4}$ is (are)

A $x \neq 2, x \neq -2$

B $x \neq 2\sqrt{3}$

C $x \neq 2$

D $x \neq 4$

Handwritten note: x \neq 2, -2

39. What is $\frac{5(4x^2 - y^2)}{2x^2 - 15xy - 8y^2}$ in simplest form? State any non-permissible values.

A $\frac{5(2x+y)}{x-8y}, x \neq \frac{y}{2}, x \neq +8y$

B $\frac{5(2x+y)}{x+8y}, x \neq \frac{y}{2}, x \neq -8y$

C $\frac{5(2x-y)}{x+8y}, x \neq \frac{y}{2}, x \neq -8y$

D $\frac{5(2x-y)}{x-8y}, x \neq \frac{y}{2}, x \neq 8y$

40. Simplify $\frac{24x^2 + 101x + 105}{9x^2 + 42x + 49}$.

A $\frac{8x+15}{-3x-7}$

B $\frac{8x+15}{3x+7}$

C $\frac{-8x-15}{-3x-7}$

D $\frac{8x-15}{-3x+7}$

$$40. \quad \frac{24x^2 + 101x + 105}{9x^2 + 42x + 49} = \frac{\cancel{(3x+7)}(7x+15)}{\cancel{(3x+7)}(3x+7)}$$

$\begin{matrix} \nearrow & & \nearrow \\ 3 & & 3 \end{matrix}$

$$41. \quad \frac{x^2 + 6x}{x^2 + 15x + 27} \times \frac{x+3}{x^2 - 36}$$

$$\frac{\cancel{x}(x+6)}{(x+9)\cancel{(x+3)}} \times \frac{\cancel{(x+3)}}{\cancel{(x+6)}(x-6)} = \frac{x}{(x+9)(x-6)}$$

$$42. \quad \frac{(x+8)(x+5)}{(x+3)(x+3)} \times \frac{(x+4)\cancel{(x+3)}}{(x+1)(x+3)} = \frac{x+4}{x+1}$$

$$43. \quad \frac{(x+8)(x+5)}{(x+5)(x+4)} + \frac{(x+5)(x+5)}{(x+4)(x+3)}$$

$$x^2 + 13x + 32 + 24 + \frac{x^2 + 5x + 5x + 25}{(x+4)(x+3)}$$

$$x^2 + 0x + 49$$

$$(x+5)(x+4)(x+3)$$

$$44. \quad \frac{-2(x+7)}{x-7} + \frac{4(x-7)}{x+7} = \frac{-2x-14+4x-28}{(x-7)(x+7)}$$

$$\frac{2x-2(x+7)}{(x-7)(x+7)} \quad \frac{2x+2x+14}{(x-7)(x+7)}$$

~~$$\frac{2x-42}{(x-7)(x+7)} = \frac{4x+14}{(x-7)(x+7)}$$~~

~~$$\frac{2x-42}{3x+14} = \frac{2(x-21)}{3x+14}$$~~

41. Express the product $\frac{x^2 + 6x}{2x^2 + 15x + 27} \times \frac{x + 3}{x^2 - 36}$ in simplest form.

A $\frac{(x^2 + 6x)(x + 3)}{(2x^2 + 15x + 27)(x^2 - 36)}$

C $\frac{x}{(2x - 36)(x + 6)}$

B $\frac{x}{(2x + 9)(x - 6)}$

D $\frac{1}{2x + 9}$

42. Express the quotient $\frac{x^2 - 5x - 24}{x^2 - 11x + 24} \div \frac{2x^2 + 7x + 3}{x^2 + x - 12}$ in simplest form.

A $\frac{2x + 1}{x + 4}$

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

B $\frac{x + 4}{2x + 1}$

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

43. When fully simplified, ignoring restrictions on the variable, $\frac{x + 8}{x^2 + 9x + 20} + \frac{x + 5}{x^2 + 7x + 12}$ is equal to

A $\frac{2x + 13}{2x^2 + 16x + 32}$

C $\frac{2x^2 - 21x - 49}{(x + 5)(x + 4)(x + 3)}$

B $\frac{(x + 8)(x + 5)}{(x^2 + 9x + 20)(x^2 + 7x + 12)}$

D $\frac{2x^2 + 21x + 49}{(x + 5)(x + 4)(x + 3)}$

44. Simplify $\frac{\frac{-2}{x-7} + \frac{4}{x+7}}{\frac{x}{x^2-49} - \frac{-2}{x-7}}$. State any non-permissible values.

A $\frac{2}{x-7}, x \neq \pm 2$

C $\frac{2(x-21)}{(3x+14)}, x \neq \pm 7$

B $\frac{2}{x+2}, x \neq \pm 7$

D $\frac{2(-x+21)}{(3x+14)}, x \neq \pm 2$

45. Evaluate the expression $|8.5 + 8(7)|$.

A -67.5

C 64.5

B -64.5

D -67.5

46. Determine the value of the absolute value expression $5|(-8 - (-9))|$.

A -5

C -85

B 85

D 5

$$48. \quad |6x+9|+2=8$$

$$|6x+9|=6$$

$$-(6x+9)=6$$

$$-6x-9=6$$
$$\quad \quad \quad +9 \quad +9$$

$$-6x=15$$
$$\quad \quad \quad -6 \quad -6$$

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

$$+(6x+9)=6$$

$$6x+9=6$$
$$\quad \quad \quad -9 \quad -9$$

$$6x = -3$$

$$x = -\frac{1}{2}$$

$$|6(-\frac{5}{2})+9|+2=8$$

$$49. \quad |4x+8| = -8x+3$$

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

$$-4x-8 = -8x+3$$
$$8x+8 \quad +8x+8$$

$$4x=11 \quad x = \frac{11}{4}$$

X

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

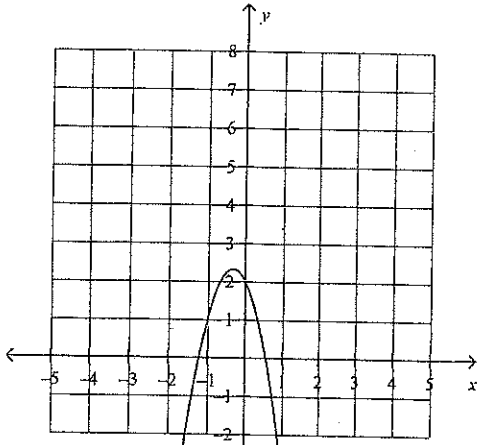
$$4x+8 = -8x+3$$
$$+8x+8 \quad +8x+8$$

$$\frac{12x}{12} = \frac{-5}{12}$$

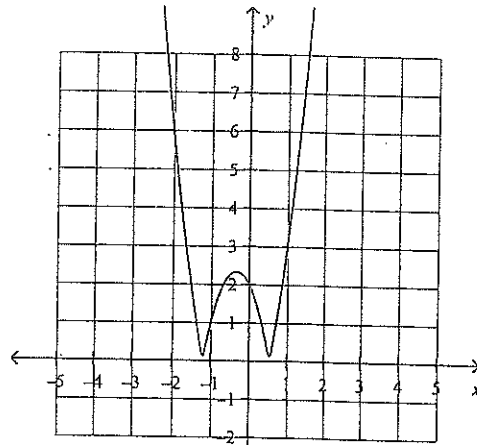
$$x = -\frac{5}{12}$$

47. The graph of $y = |-3x^2 + 2x + 2|$ is

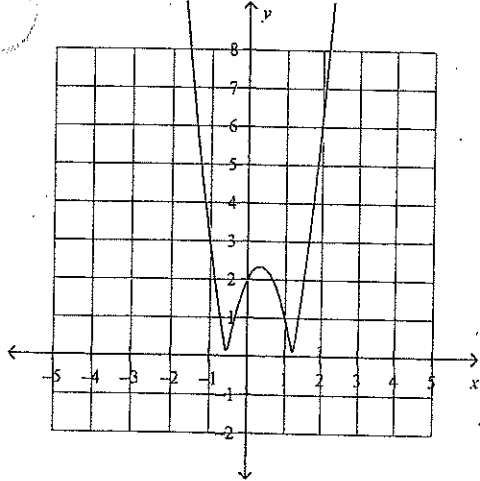
A



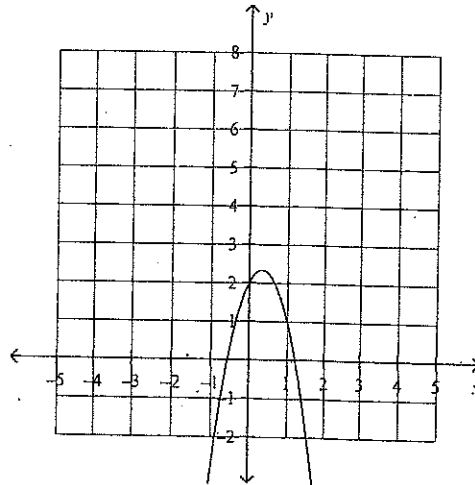
C



B



D



48. Determine the solution to $|6x + 9| + 2 = 8$.

A $x = -\frac{1}{2}$ or $x = -\frac{5}{2}$

C $x = \frac{1}{2}$ or $x = \frac{5}{2}$

B no solution

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

49. What is the solution to $|4x + 8| = -8x + 3$?

A $x = -\frac{5}{12}$ or $x = \frac{11}{4}$

C $x = \frac{5}{12}$

B $x = \frac{5}{12}$ or $x = \frac{11}{4}$

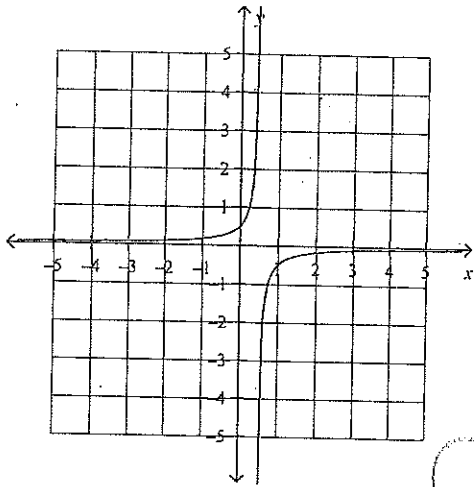
D $x = -\frac{5}{12}$

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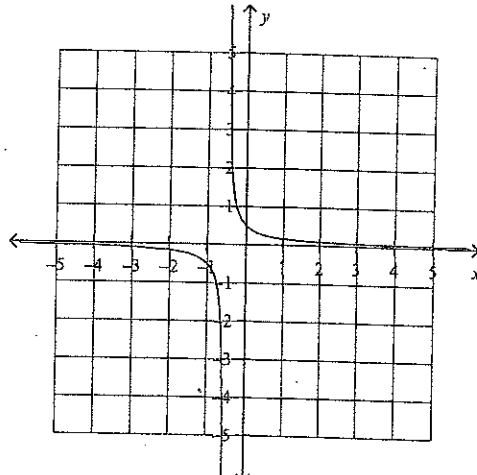
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50. Which graph represents the reciprocal of the linear function $y = 4x - 2$?

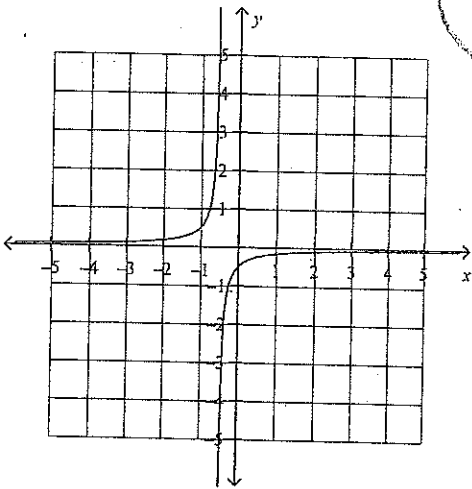
A



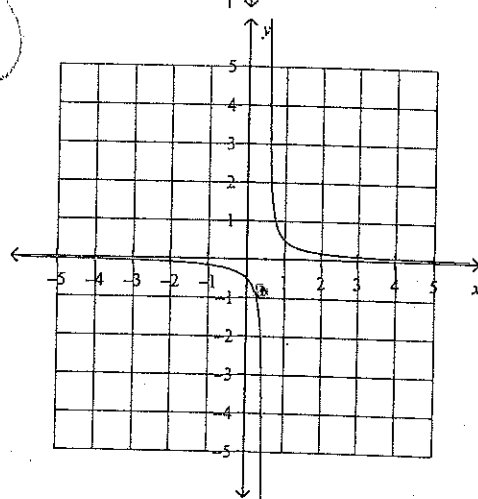
C



B



D



$$y = 4x - 2$$

$$0 = 4x - 2$$

$$2 = 4x$$

$$\frac{1}{2} = x$$



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

look for the
1/5 and -1/5

$$-1 = \frac{1}{4x - 2}$$

$$-4x + 2 = 1$$

$$-2 = -2$$

$$-4x = -1$$

$$x = \frac{1}{4}$$

$$\left(\frac{1}{4}\right) = 1$$

$$S2: (y = 4x + 8)^{-1}$$

$$y = -4x^2 - 5x + 8$$

$$-y = -4x - 8$$

$$y = -4x^2 - 5x + 8$$

$$0 = -4x^2 - 9x$$

$$4x^2 + 9x = 0$$

$$x(4x + 9) = 0$$

$$x = 0 \quad x = -\frac{9}{4}$$

$$y = 4x + 8$$

$$y = 4(0) + 8$$

$$y = 8$$

$$(0, 8)$$

$$y = \left(-\frac{9}{4}\right) + 8$$

$$y = \frac{23}{4}$$

$$\left(-\frac{9}{4}, \frac{23}{4}\right)$$

$$53. \quad (y = -6x + 9) \quad | \quad y = -8x^2 - 9x + 9$$

$$\textcircled{-y = 6x - 9} \\ \underline{y = -8x^2 - 9x + 9}$$

$$0 = 8x^2 - 3x$$

$$8x^2 + 3x = 0$$

$$x(8x + 3) = 0$$

$$x = 0, \quad -\frac{3}{8}$$

$$y = -6(0) + 9$$

$$y = 9$$

$$(0, 9)$$

$$y = -\frac{6}{1}\left(-\frac{3}{8}\right) + 9$$

$$y = \frac{18}{8} + 9$$

$$y = \frac{9}{4} + \frac{36}{4}$$

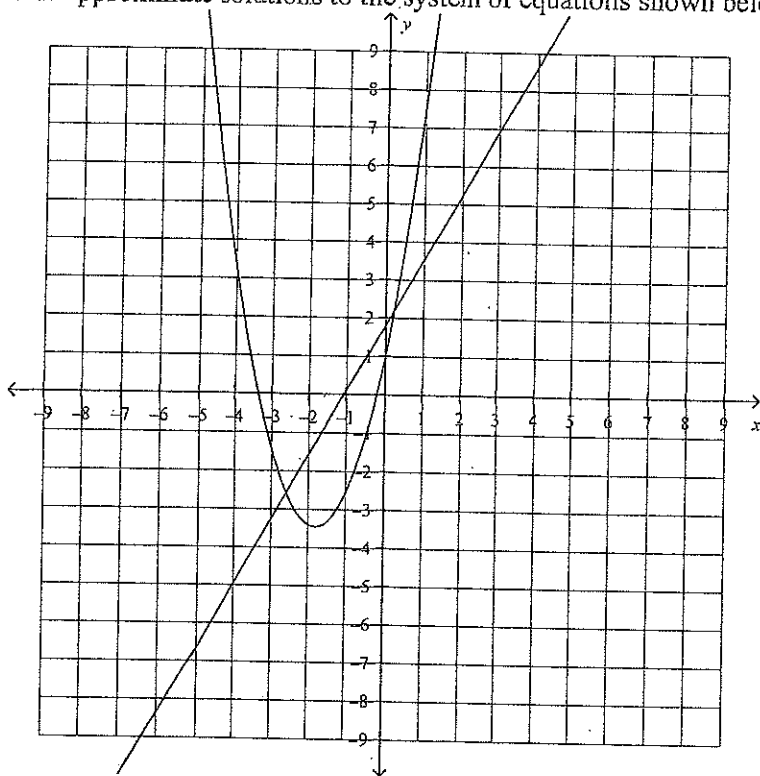
$$y = \frac{9}{4} + \frac{36}{4} = \frac{45}{4}$$

$$\left(-\frac{3}{8}, \frac{45}{4}\right)$$

Name: _____

ID: A

51. The approximate solutions to the system of equations shown below are



- A (-0.2, -2.2) and (2.6, 2.6)
- B (-2.2, -0.2) and (2.6, 2.6)

- C (2.2, 0.2) and (-2.6, -2.6)
- D (0.2, 2.2) and (-2.6, -2.6)

52. Find the coordinates of the point(s) of intersection of the line $y = 4x + 8$ and the quadratic function $y = -4x^2 - 5x + 8$.

- A (0, 8) and $(\frac{9}{4}, 17)$
- B (0, 0)

C (2, -34)

D $(-\frac{9}{4}, -1)$ and (0, 8)

53. Solve the following system:

$$y = -6x + 9$$

$$y = -8x^2 - 9x + 9$$

A $(-\frac{3}{2}, -\frac{27}{2})$

B $(0, \frac{27}{8})$ and $(\frac{3}{8}, \frac{9}{8})$

C $(-\frac{3}{8}, \frac{45}{4})$ and (0, 9)

D (0, 0)

Name: _____

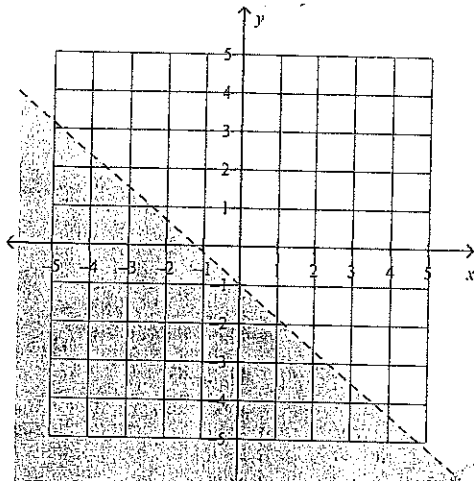
$$-6y \leq 5x + 6$$

$$y \geq \frac{-5x - 6}{6}$$

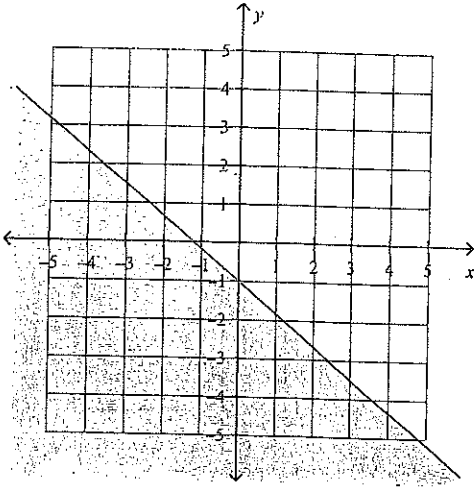
ID: A

54. The graph of $-5x - 6y \leq 6$ is

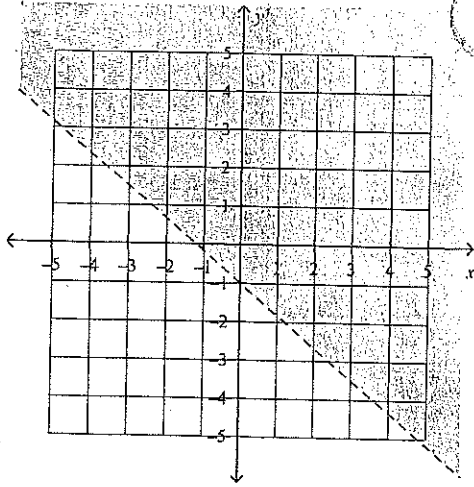
A



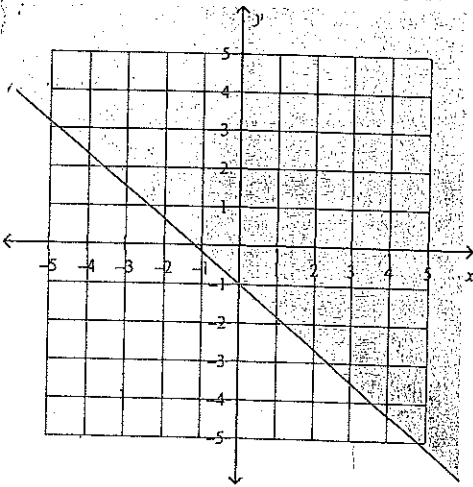
C



B



D



$$-5x - 6y \leq 6$$

$$+5x \quad +5x$$

$$-6y \leq 5x + 6$$

$$-6 \downarrow -6 \quad -6$$

$$y \geq \frac{-5x - 6}{6}$$

Solid line and greater

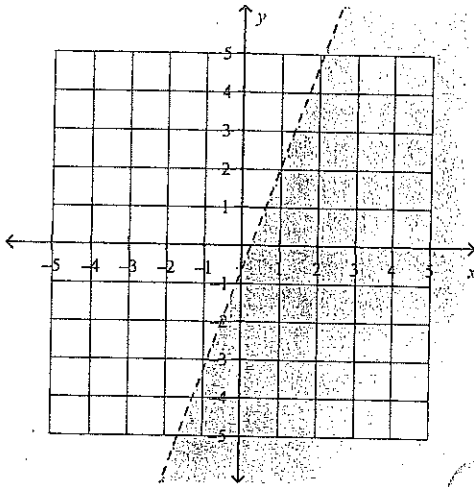
Name: _____

oblique and less than

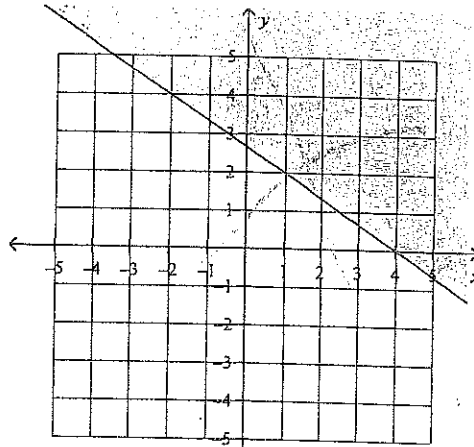
ID: A

55. The graphical solution to $y < -\frac{2}{3}x + \frac{8}{3}$ is

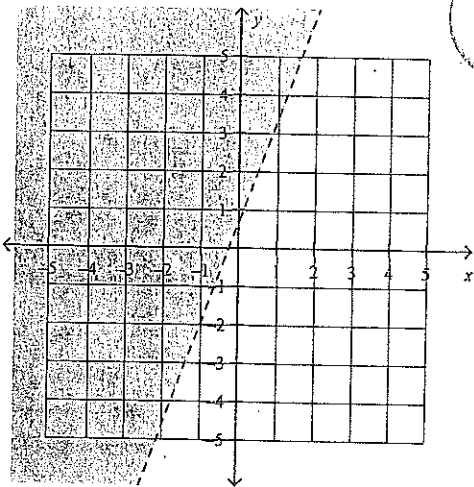
A



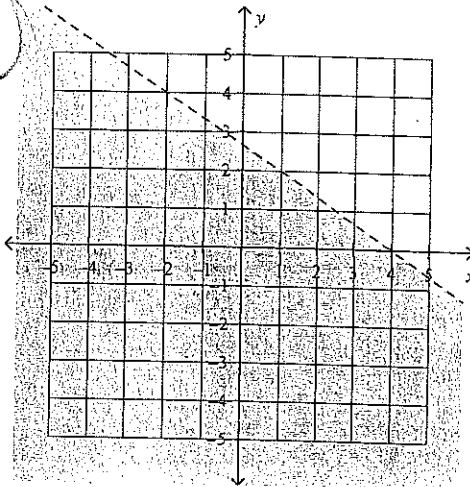
C



B



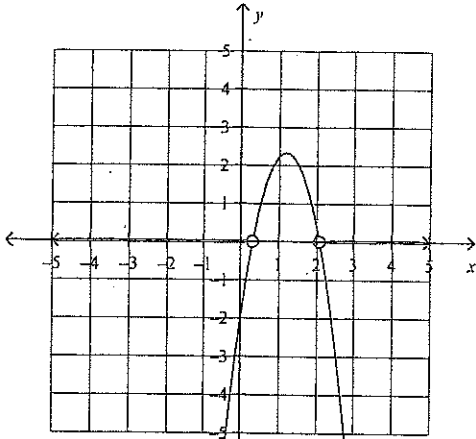
D



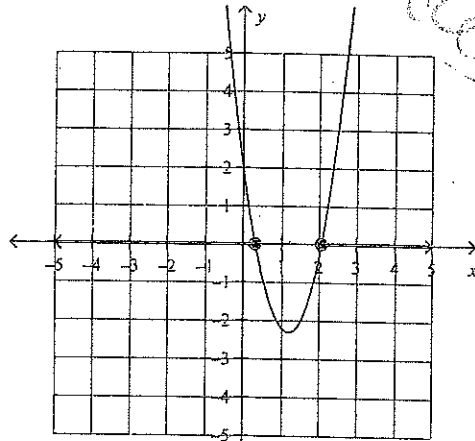
Use circles

56. Which graph represents the solution to the inequality $3x^2 - 7.2x + 2 < 0$?

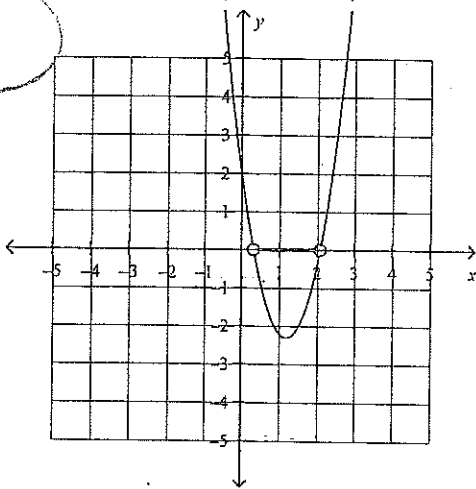
A



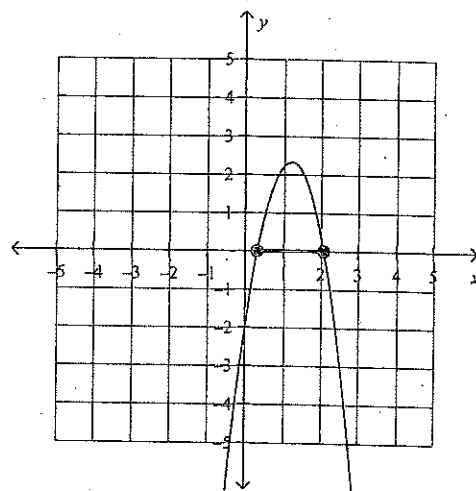
C



B



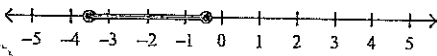
D



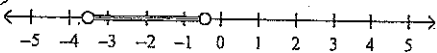
57. Which number line represents the solution set to the inequality $-2x^2 - 7.9x > 3$?

Use

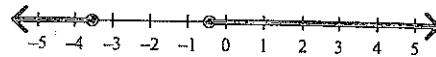
A



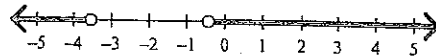
B



C



D



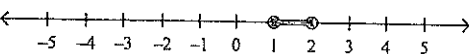
Use $ax^2 + bx + c = 0$

58. Which graph represents the solution to the inequality $2x^2 - 6x + 4 \geq 0$?

A



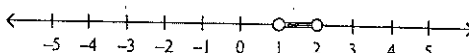
B



C



D



$2(x^2 - 3x + 2) \geq 0$

$(x-2)(x-1) \geq 0$

$x \leq 1, x \geq 2$

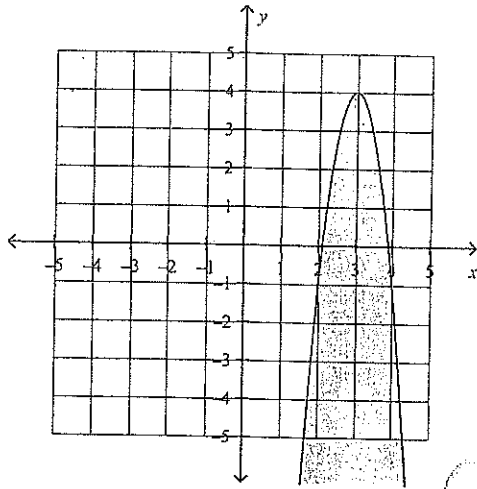
Use test points

Name: _____

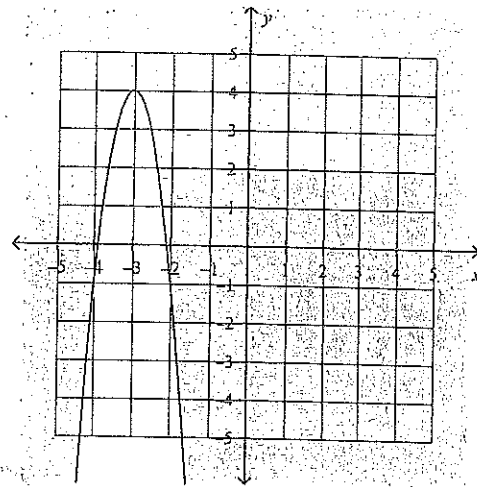
ID: A

59. Which graph represents the solution to the inequality $y \leq -5(x+3)^2 + 4$?

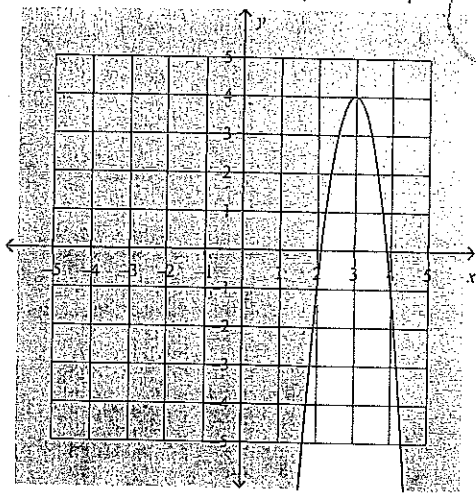
A



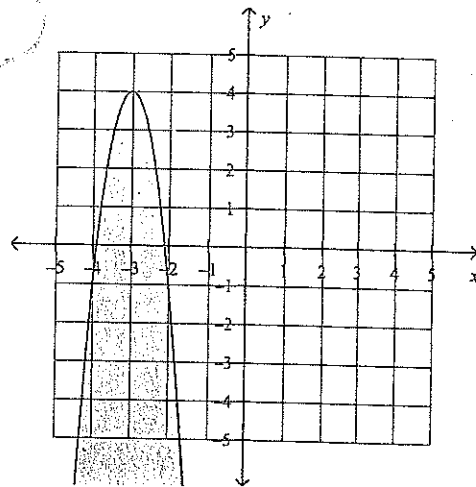
C



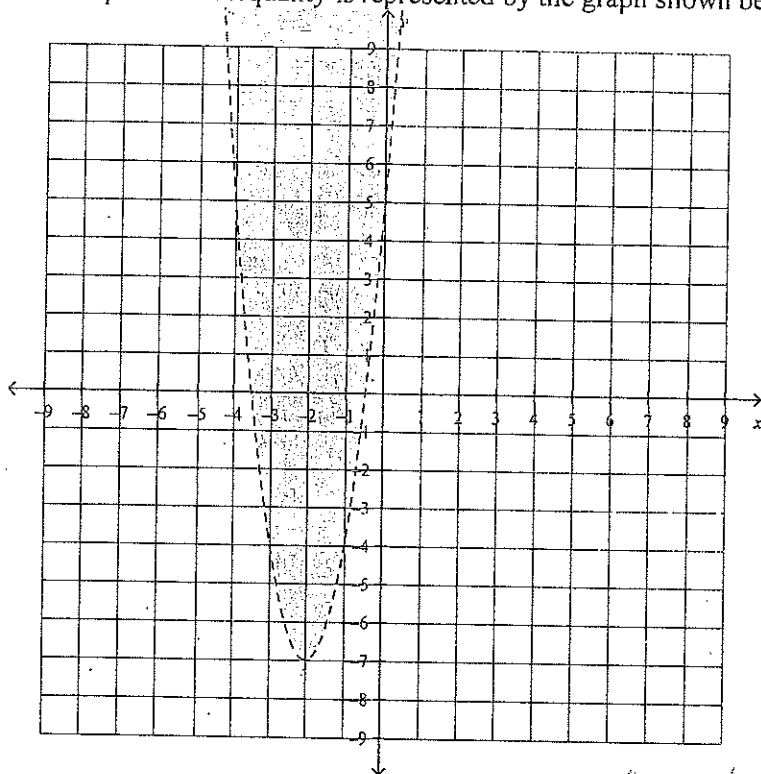
B



D



60. Which quadratic inequality is represented by the graph shown below?



A $y > -3(x+2)^2 - 7$

B $y > 3(x+2)^2 - 7$

C $y > -3(x-7)^2 - 2$

D $y \leq 3(x-7)^2 - 2$

Handwritten note: $3(x+2)^2 - 7$
 9th direction
 50
 x

Short Answer

- A bouncy ball bounces to $\frac{2}{3}$ its height when it is dropped on a hard surface. Suppose the ball is dropped from 20 m.
 - What height will the ball bounce back up to after the sixth bounce?
 - What is the total distance the ball travels if it bounces indefinitely?

2. Solve $4 - \sqrt{4+x^2} = x$.

3. Solve $\sqrt{b+1} = \sqrt{b+6} - 1$.

Simplify each expression and state any non-permissible values.

4. $\frac{5}{x^2-1} - \frac{2}{x^2+4x+3} + \frac{3}{x^2+2x-3}$

5. Solve and check.

$$\frac{5}{x-1} + \frac{2}{x+1} = -6$$

Short Answer

$$\#1 \quad t_1 = 20 \left(\frac{2}{3} \right)$$

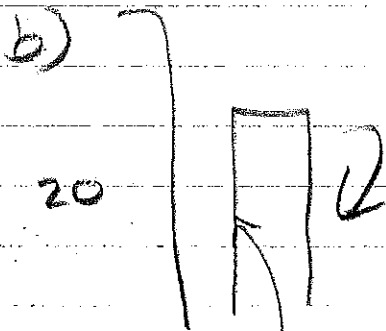
$$\text{CR: } \frac{2}{3}$$

$$= \frac{40}{3}$$

$$t_n = t_1 r^{n-1} \quad \left(\frac{40}{3} \right) \left(\frac{2}{3} \right)^{6-1}$$

$$\left(\frac{40}{3} \right) \left(\frac{2}{3} \right)^5 =$$

$$\frac{40}{3} \cdot \frac{32}{243} \approx 1.76$$



$$20 \cdot \frac{2}{3} \cdot 2$$

$$\frac{80}{3}$$

$$5 \infty = \frac{t_1}{1-r}$$

$$\frac{80}{1 - \frac{2}{3}}$$

$$\frac{80}{\frac{1}{3}} = 80 + 20$$

$$= 80 + 20$$

the original amount of drop

$$\text{total} = 100 \text{ m}$$

Short Answer:

$$\#2 \quad 4 = \sqrt{4+9} = 2$$

$$(\sqrt{4+9})^2 = (2)^2$$

$$\cancel{4+9} = \cancel{4} + 16$$

$$\frac{-12}{-8} = \frac{-8}{-8}$$

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

$$4 = \sqrt{\frac{4}{4} + \frac{9}{4}} = \frac{3}{2}$$

$$4 = \sqrt{\frac{16}{4} + \frac{9}{4}} = \frac{5}{2}$$

$$4 = \sqrt{\frac{25}{4}} = \frac{5}{2}$$

$$4 = \frac{5}{2} = \frac{3}{2}$$

$$\frac{8}{2} = \frac{5}{2} = \frac{3}{2}$$

$$\frac{4}{2} = \frac{3}{2}$$

$$\#3 \quad (\sqrt{b+1})^2 = (\sqrt{b+6} - 1)$$

$$b+1 = b+6 - 2\sqrt{b+6} + 1$$

~~$$b+1 = b+7 - 2\sqrt{b+6}$$~~

~~$$-6 = -2\sqrt{b+6}$$~~

~~$$3 = \sqrt{b+6}$$~~

~~$$9 = b+6$$~~

~~$$3 = b$$~~

$$\sqrt{3+1} = \sqrt{3+6} - 1$$

$$2 = 3 - 1$$



$$E4 \quad \frac{5(x+3)}{(x-1)(x+1)} - \frac{2(x-1)}{(x+3)(x+1)} + \frac{3(x+1)}{(x+3)(x-1)}$$

$(x+3)$
 $(x-1)$
 $(x+1)$

$$5x+15 - 2x+2 + 3x+3$$

$$(x-1)(x+1)(x+3)$$

NARS#
6-5-3

$$6x+20$$

$$(x-1)(x+1)(x+3)$$

$$E5 \quad \left(\frac{5}{x-1} + \frac{2}{x+1} = \frac{-6}{1} \right) \begin{matrix} (x-1) \\ (x+1) \end{matrix}$$

$(x-1)$
 $x-1$

$$5x+5+2x-2 = -6x^2+6$$

$$7x+3 = -6x^2+6$$

$$+6x^2 \quad -6 \quad +6x^2-6$$

$$6x^2+7x-3=0$$

$$(3x-1)(2x+3)=0$$

$$3x-1=0$$

$$2x+3=0$$

$$3x=1$$

$$2x=-3$$

$$x = \frac{1}{3}$$

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