Name: _____

Simplify the given expression. Assume that no variable equals 0.

D 2. $20x\left(8xy^{20}\right)\left(-10x^{-10}y^{10}\right)$

$-1600x^{-8}y^{30} = \frac{-1600y^{30}}{x^8}$

a. $-1600x^{-11}y^{-70}$

b. $\frac{18y^{30}}{x^8}$

c. $-1600x^{-8}y^{30}$

(d.) $\frac{-1600y^{30}}{x^8}$

A 3. $\left(19x^{-12}y^{6}\right)\left(-4xy^{7}\right)$ $= -76x^{-11}y^{13} = \frac{-76y^{13}}{x^{11}}$

(a.) $\frac{-76y^{13}}{x^{11}}$

b. $\frac{15y^{13}}{x^{11}}$

c. $-76x^{-13}y^{-108}$

d. $-76x^{-11}y^{13}$

A 4. $\left(\frac{12x^{19}y^{9}}{24x^{11}y^{13}}\right)^4$ $\frac{20736x^{76}y^{36}}{331776x^{44}y^{52}} = \frac{x^{32}}{16y^{16}}$

(a.) $\frac{x^{32}}{16y^{16}}$

b. $\frac{x^{32}y^{-16}}{16}$

c. $\frac{x^{32}}{2y^{16}}$

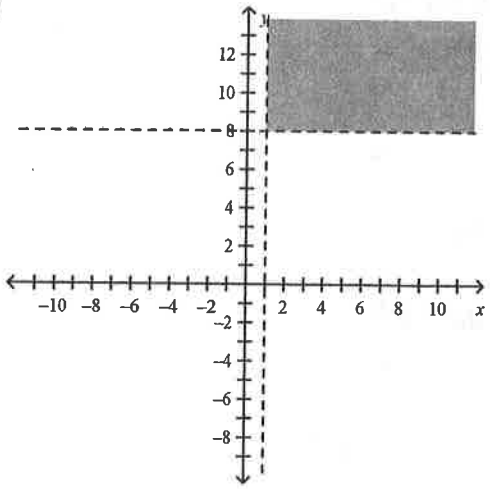
d. $\frac{x^{8}}{16y^{4}}$

Name: _____ ID: C

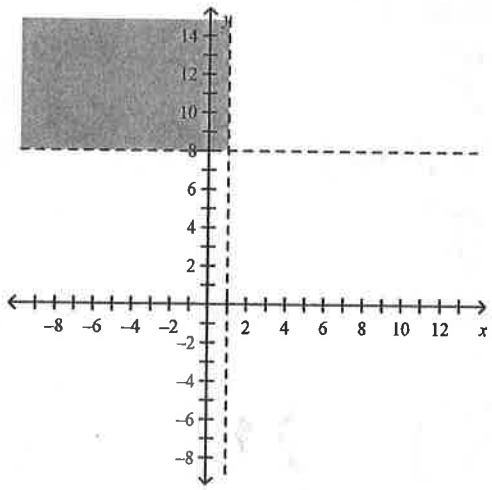
Solve the system of inequalities by graphing.

A 5. $x > 1$
$y > 8$

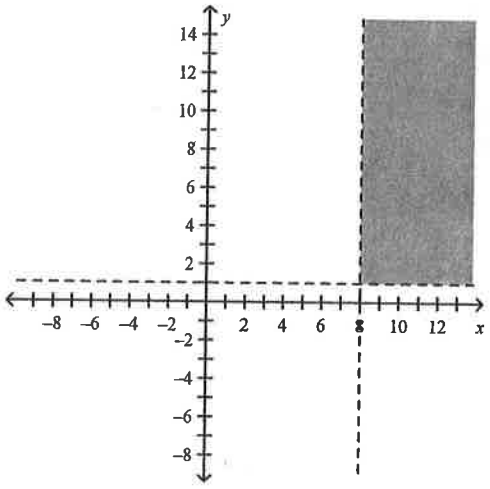
a.



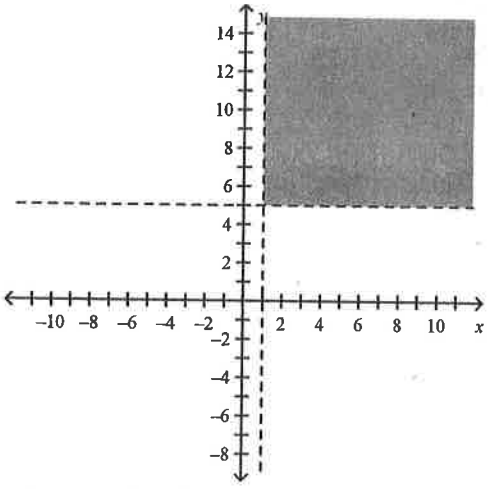
c.



b.



d.



B 6. Write an equation in slope-intercept form for the line that satisfies the following condition.
passes through (–6, 16), perpendicular to the graph of $3x + 13y = 2$

$13y = -3x + 2$

$y = \frac{-3}{13}x + \frac{2}{13}$

$16 = 13/3(-6) + b$

$b = 42$

a. $y = -6x + \frac{13}{3}$

c. $y = \frac{13}{3}x + \frac{13}{3}$

b. $y = \frac{13}{3}x + 42$

d. $y = -6x + 13$

Simplify the given expression.

D 7. $y^{\frac{2}{7}} y^{\frac{4}{7}} = y^{6/7}$

a. $y^{\frac{12}{7}}$

c. $y^{\frac{2}{7}}$

b. $y^{\frac{8}{7}}$

d. $y^{\frac{6}{7}}$

Name: _____ ID: C

C 8. $-5xy(6xy^3 - 4xy + 7y^2) = -30x^2y^4 + 20x^2y^2 - 35xy^3$

a. $-30x^2y^4 - 4x^2y^2 + 7x^2y^3$
c. $-30x^2y^4 + 20x^2y^2 - 35xy^3$
b. $-30x^2y^4 + 20xy + -35y^2$
d. $-30x^2y^4 - 4xy + 7y^2$

B 9. $\left[y^{-\frac{18}{3}}\right]^{-\frac{36}{3}}$

a. $y^{\frac{54}{3}}$
c. $y^{\frac{-18}{3}}$
b. $y^{\frac{648}{9}}$ Reduce the fraction y^{72}
d. $y^{\frac{648}{3}}$

D 10. $\left(4x^2 - 5x - 17\right) + \left(10x^2 - 10\right) = 14x^2 - 5x - 27$

a. $14x^2 - 5x + 27$
c. $14x^2 - 27$
b. $14x^2 - 5x - 7$
d. $14x^2 - 5x - 27$

A 11. $\left(-10x^2 - 4x + 12\right) - \left(12x^2 + 19x - 3\right) = -22x^2 - 23x + 15$

a. $-22x^2 - 23x + 15$
c. $-22x^2 - 16x + 9$
b. $-22x^2 - 15x + 15$
d. $-22x^2 - 23x + 9$

___ 12. Name the sets of numbers to which the given number belongs.

$\frac{28}{83}$

a. N, W, Z, Q
b. N, W, Z, I, R
c. N, W, Z, Q, R
d. W, Z, I, R

Simplify.

D 13. $\sqrt{81x^{18}y^6} = 9x^9y^3$

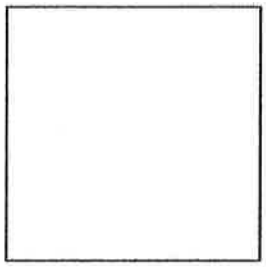
a. $40.5x^9y^3$
c. $40.5x^{18}y^6$
b. $9x^{18}y^6$
d. $9x^9y^3$

___ 14. $\sqrt{-242x^{16}y^{20}}$

a. $11x^8y^{10}\sqrt{2}$
c. $-i11x^8y^{10}\sqrt{2}$
b. $11x^8y^{10}\sqrt{-2}$
d. $i11x^8y^{10}\sqrt{2}$

C

15. The formula for the area A of a square with side s is $A = s^2$. Write an expression to represent the area of the square.



a. $(x+3)$ b. x^2 c. $(x+3)^2$ d. x^2+9

Solve the given inequality. Describe the solution set using the set-builder or interval notation. Then, graph the solution set on a number line.

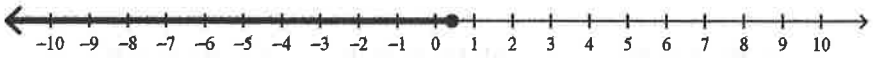
A

16. $8(11m+6) \leq 10$

$88m + 48 \leq 10$ $88m \leq -38$ $m \leq -0.43$

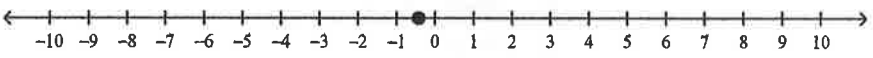
a. The solution set is $\{-\infty, -0.43\}$.

b. The solution set is $\{-\infty, 0.43\}$.



c. The solution set is $\{-0.43, \infty\}$.

d. The solution set is $\{-0.43\}$.



Name: _____

A 17. $4m + 12 < 34$

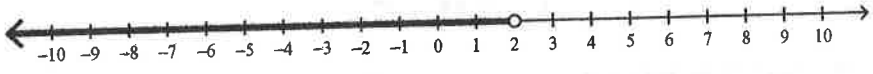
$4m < 22$

$m < 22/4 < 11/2$

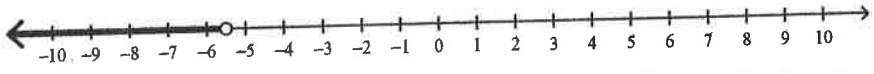
(a.) The solution set is $\{m \mid m < \frac{11}{2}\}$.

b. The solution set is $\{m \mid m < \frac{11}{6}\}$.

c. The solution set is $\{m \mid m < \frac{2}{11}\}$.



d. The solution set is $\{m \mid m < -\frac{11}{2}\}$.

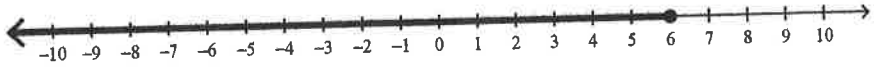


C 18. $\frac{8-p}{2} \leq 1$

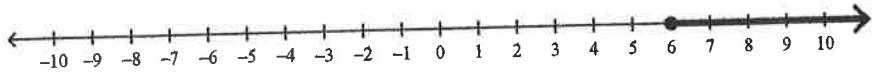
$8 - p \leq 2 \quad -p \leq -6 \quad p \geq 6$

a. The solution set is $\{-\infty, \frac{1}{4}\}$.

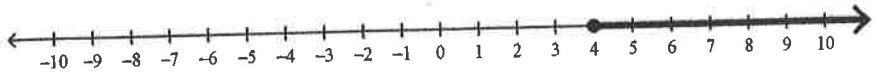
b. The solution set is $\{-\infty, 6\}$.



(c.) The solution set is $\{6, \infty\}$.



d. The solution set is $\{4, \infty\}$.



Find the coordinates of the vertex of the quadratic function.

B 19. $y = -5x^2 + 20x - 13$

a. $(7, 2)$

(b.) $(2, 7)$

c. $(-2, -7)$

d. $(-7, -2)$

$\frac{-20}{2(-5)} = \frac{-20}{-10} = 2$

Name: _____ ID: C

A 20. Write an equation in slope-intercept form for the line that satisfies the following condition.

x-intercept $\frac{7}{13}$ and y-intercept $\frac{17}{30}$.

(7/13, 0) (0, 17/30)

a. $y = \frac{-221}{210}x + \frac{17}{30}$

b. $y = \frac{17}{30}x + \frac{7}{17}$

c. $y = \frac{-221}{210}x + 7$

d. $y = \frac{-221}{210}x + 17$

$\frac{17/30}{-7/13} = \frac{-221}{210}$

b = 17/30

Solve each system of equations by using substitution.

B 21. $2r + 6s = 20$
$4r - 6s = 18$

6r = 38
r = 6.34

2(6.34) + 6s = 20

a. 6.34, 3.22

b. 6.34, 1.22

c. 13.66, 3.22

d. 13.66, 1.22

Solve the given equation. Check your solution.

B 22. $57p - 13p + 61p - p = 128$

104p = 128

a. –0.13

b. 1.23

c. 0.98

d. –8.00

Solve the equation by using the Square Root Property.

___ 23. $16x^2 + 32x + 16 = 81$

a. $\{\frac{13}{4}, -\frac{5}{4}\}$

b. $\{\frac{5}{4}, -\frac{13}{4}\}$

c. $\{-1, 9\}$

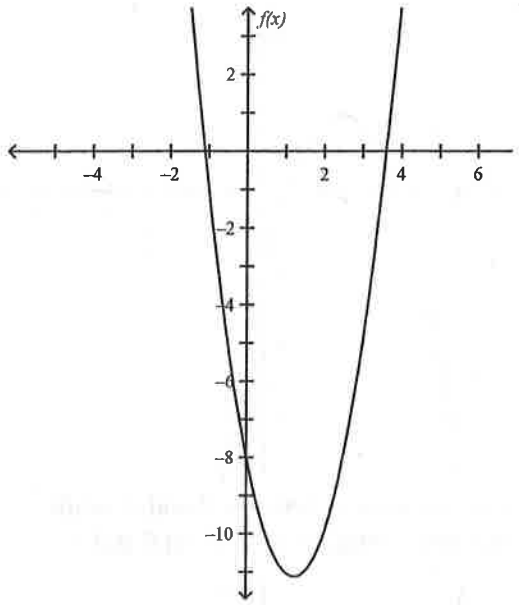
d. $\{-1\}$

Name: _____ **ID: C**

Solve the equation by graphing. If exact roots cannot be found, state the consecutive integers between which the roots are located.

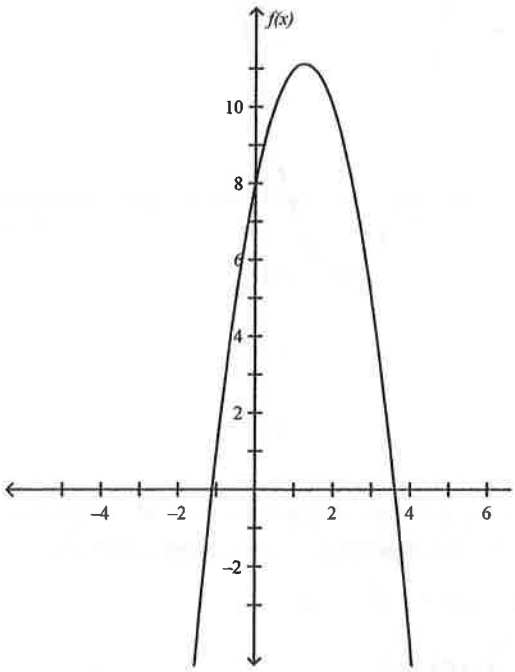
24. $-2x^2 + 5x + 8 = 0$

a.



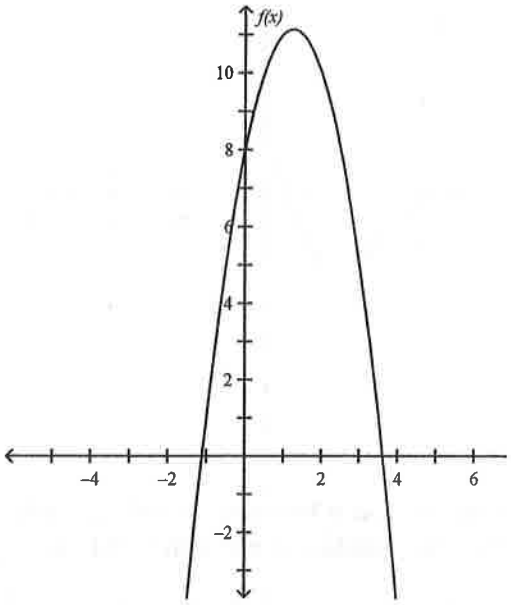
One solution is between 3 and –1, while the other solution is between 4 and –2.

b.



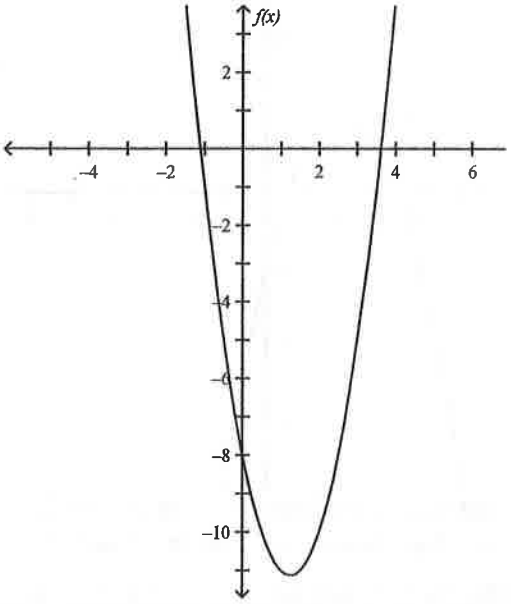
One solution is between –1 and –2, while the other solution is between 3 and 4.

c.



One solution is between 3 and –2, while the other solution is between –1 and 4.

d.

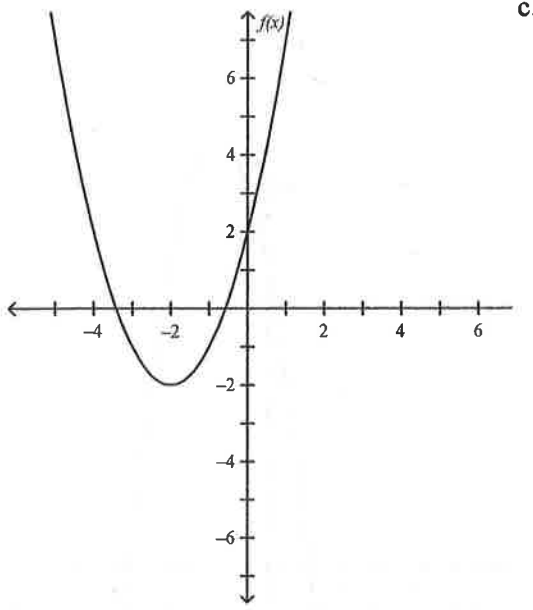


One solution is between –3 and –4, while the other solution is between 1 and 2.

Name: _____ **ID: C**

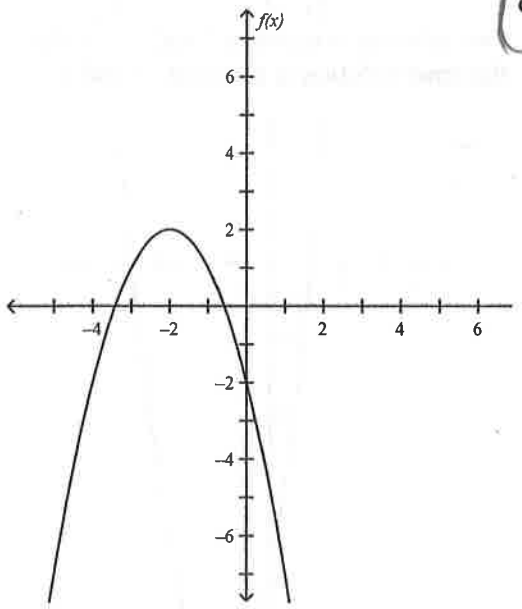
D 25. $x^2 + 4x + 2 = 0$

a.



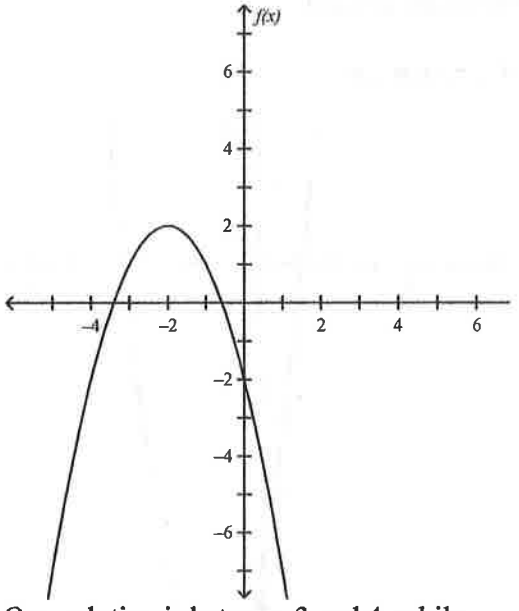
One solution is between –3 and –1, while the other solution is between 0 and –4.

b.



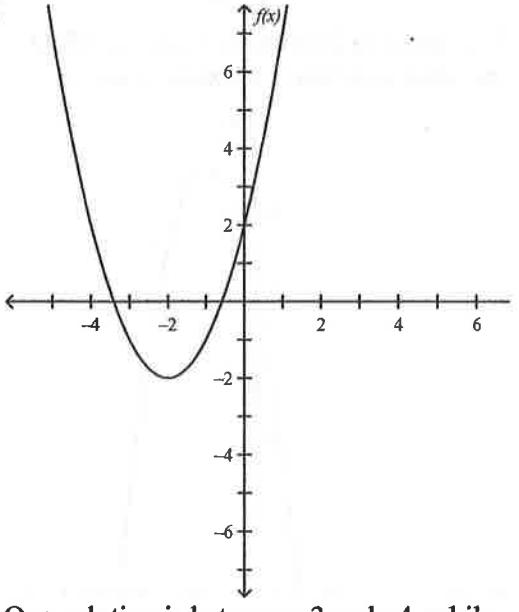
One solution is between –3 and 0, while the other solution is between –4 and –1.

c.



One solution is between 3 and 4, while the other solution is between 0 and 1.

d.



One solution is between –3 and –4, while the other solution is between 0 and –1.

C 26. Find the value of $f(4)$ and $g(-10)$ if $f(x) = -8x - 8$ and $g(x) = 2x^2 - 22x$.

a. $f(4) = -16$
$g(-10) = 102$

b. $f(4) = -24$
$g(-10) = -2208$

c. $f(4) = -40$
$g(-10) = 420$

d. $f(4) = 80$
$g(-10) = 8$

$f(4) = -8(4) - 8 = -32 - 8 = -40$

$g(-10) = 2(-10)^2 - 22(-10) = 2(100) + 220$

$200 + 220 = 420$

B 27. Consider the quadratic function $f(x) = -2x^2 + 5x + 2$. Find the y-intercept and the equation of the axis of symmetry.

a. The y-intercept is -2.
The equation of axis of symmetry is $x = -\frac{5}{4}$.

b. The y-intercept is $+2$.
The equation of axis of symmetry is $x = \frac{5}{4}$.

c. The y-intercept is $-\frac{5}{4}$.
The equation of axis of symmetry is $x = -2$.

d. The y-intercept is $\frac{5}{4}$.
The equation of axis of symmetry is $x = +2$.

y-int = 2

$\frac{-b}{2a} = \frac{-5}{-2(2)} = \frac{-5}{-4} = \frac{5}{4}$

Name: _____ **ID: C**

C 30. $x^2 + 8x - 48 = 0$

a. {4, 12}
b. {–4, 12}
c. {–12, 4}
d. {–4, –12}

$(x+12)(x-4)$
$x=-12$ $x=4$

Determine whether the given function has a maximum or a minimum value. Then, find the maximum or minimum value of the function.

A 31. $f(x) = -2x^2 + 10x + 3$

a. The function has a minimum value. The minimum value of the function is 15.5.
b. The function has a maximum value. The maximum value of the function is 15.5.
c. The function has a maximum value. The maximum value of the function is –34.5.
d. The function has a minimum value. The minimum value of the function is –34.5.

$\frac{-10}{-2(2)} = \frac{10}{4} = \frac{5}{2}$

$-2(5/2)^2 + 10(5/2) + 3$
$-2(25/4) + 50/2 + 3$
$-\frac{50}{4} + \frac{50}{2} + 3$

Find the exact solution of the following quadratic equation by using the Quadratic Formula.

B 32. $-x^2 + 7x + 11 = 0$

a. $\left\{\frac{-7-\sqrt{56}}{-2}, \frac{-7+\sqrt{56}}{-2}\right\}$
b. $\left\{\frac{-7-\sqrt{93}}{-2}, \frac{-7+\sqrt{93}}{-2}\right\}$
c. $\left\{\frac{7-\sqrt{93}}{-2}, \frac{7+\sqrt{93}}{-2}\right\}$
d. $\left\{\frac{-7-\sqrt{5}}{-2}, \frac{-7+\sqrt{5}}{-2}\right\}$

$\frac{-7 \pm \sqrt{7^2 - 4(-1)(11)}}{2(-1)}$

$\frac{-7 \pm \sqrt{49+44}}{-2} =$

$\frac{-7 \pm \sqrt{93}}{-2}$

B 33. Write an equation for the parabola whose vertex is at $(2, 6)$ and which passes through $(4, -4)$.

a. $y = -2.5(x+2)^2 - 6$
b. $y = -2.5(x-2)^2 + 6$
c. $y = (x+2)^2 - 6$
d. $y = 2.5(x-2)^2 + 6$

$-4 = a(4-2)^2 + 6$
$-4 = a(2^2) + 6$
$-4 = 4a + 6$
$-10 = 4a$
$a = -5/2$
$= -2.5$

Write the following quadratic function in the vertex form. Then, identify the axis of symmetry.

A 34. $y = x^2 + 4x - 6$

a. The vertex form of the function is $y = (x+2)^2 - 10$.
The equation of the axis of symmetry is $x = -2$.
b. The vertex form of the function is $y = (x+2)^2 + 10$.
The equation of the axis of symmetry is $x = -10$.
c. The vertex form of the function is $y = (x+2)^2 - 10$.
The equation of the axis of symmetry is $x = -10$.
d. The vertex form of the function is $y = (x-2)^2 - 10$.
The equation of the axis of symmetry is $x = -2$.

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

$-2^2 + 4(-2) - 6$
$4 - 8 - 6 = -10$
$y = (x+2)^2 - 10$

Name: _____ ID: C

Find the value of the discriminant. Then describe the number and type of roots for the equation.

C 35. $-4x^2 - 14x + 3 = 0$

$\sqrt{-14^2 - 4(-4)(3)}$

$\sqrt{244}$

a. The discriminant is –244. Because the discriminant is less than 0, the two roots are complex.

b. The discriminant is 196. Because the discriminant is greater than 0 and is a perfect square, the two roots are real and rational.

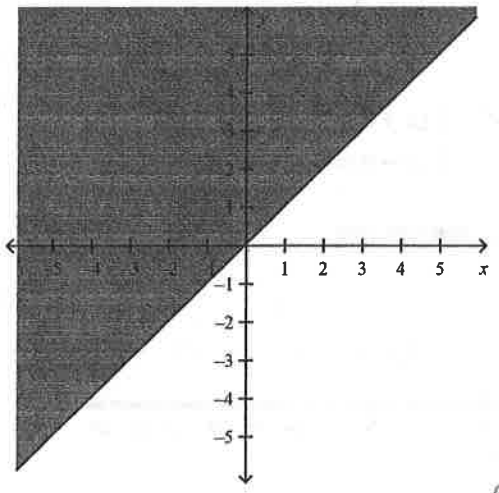
c. The discriminant is 244. Because the discriminant is greater than 0 and is not a perfect square, the roots are real and irrational.

d. The discriminant is –148. Because the discriminant is less than 0, the two roots are complex.

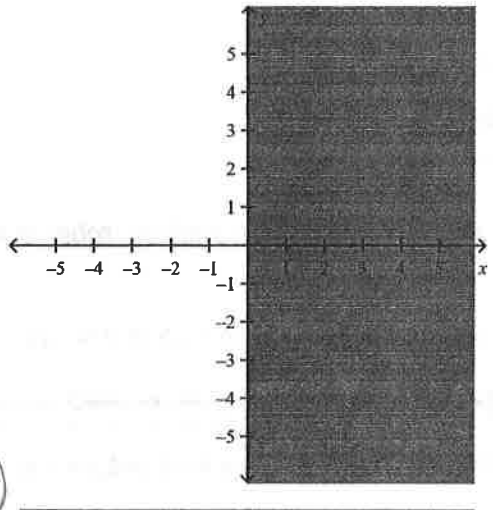
D 36. Graph the given inequality.

$10x + 20y \geq -9$ $\quad 20y \geq -10x - 9 \quad y \geq -\frac{1}{2}x - \frac{9}{20}$

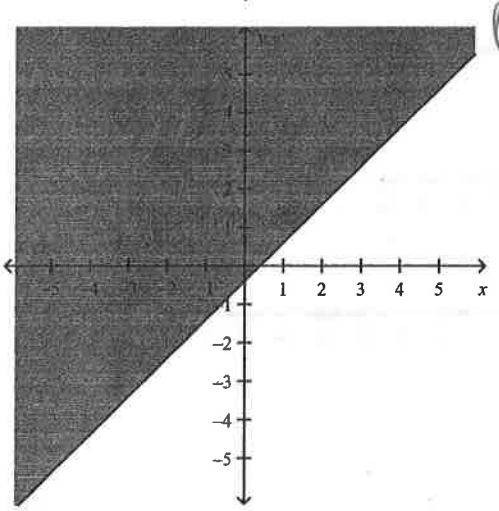
a.



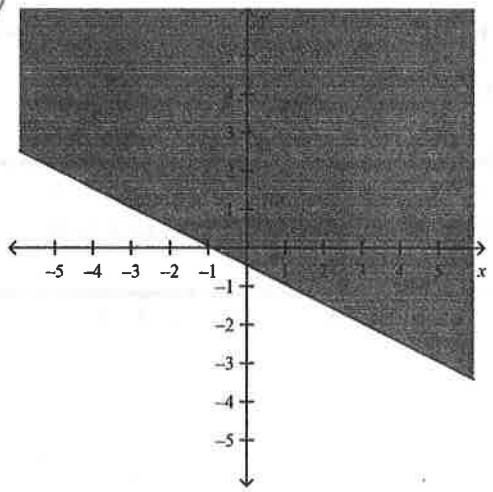
c.



b.



d.



Name: _____ **ID: C**

Simplify the expression using synthetic division.

C 37. $(3x^3 - 34x^2 + 113x - 114) \div (x - 3)$

3 | 3 −34 113 −114
↓ 9 −75 114
3 −25 38 0

$3x^2 - 25x + 38$

a. quotient $\left(12x^2 + 2x - 119\right)$ and remainder 243

b. quotient $\left(9x^2 - 7x + 92\right)$ and remainder 162

c. quotient $\left(3x^2 - 25x + 38\right)$ and remainder 0

d. quotient $\left(3x^2 - 43x - 16\right)$ and remainder –66

Write a quadratic equation with the given roots. Write the equation in the form $ax^2 + bx + c = 0$, where a, b, and c are integers.

A 38. $-\frac{1}{4}$ and 8

$(x + 1/4)(x - 8)$

$(4x + 1)(x - 8)$

$4x^2 - 32x + x - 8$

$4x^2 - 31x - 8$

a. $4x^2 - 31x - 8 = 0$

b. $4x^2 + 31x + 8 = 0$

c. $x^2 - 31x + 8 = 0$

d. $x^2 - 31x - 8 = 0$

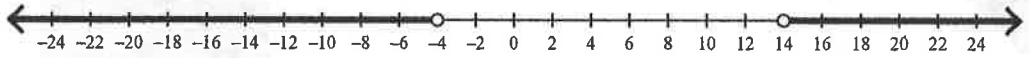
Solve the given inequality. Graph the solution set on a number line.

B 39. $|p - 5| < 9$ and

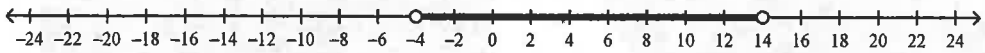
$p - 5 < 9 \quad p - 5 > -9$

$p < 14$ and $p > -4$

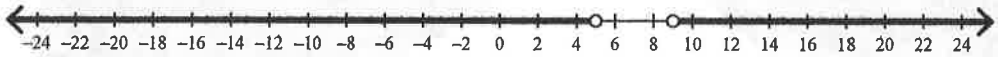
a. The solution set is $\{p \mid p > 14 \text{ or } p < -4\}$.



b. The solution set is $\{p \mid p > -4 \text{ and } p < 14\}$.



c. The solution set is $\{p \mid p > 9 \text{ or } p < 5\}$.



d. The solution set is $\{p \mid p > -4 \text{ or } p < 4\}$.

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Evaluate the expression. Express the result in scientific notation.

A 41. $\dfrac{48.82 \times 10^{26}}{2 \times 10^{5}}$

84.41 x 10^{21} → 2.441×10^{22}

a. 2.441×10^{22}
b. 24.41×10^{21}
c. 0.2441×10^{23}
d. 2.441×10^{31}

A 42. $\left(9.32 \times 10^{-3}\right)\left(9.3 \times 10^{-6}\right)$

86.676 x 10^{-9}

a. 8.6676×10^{-8}
b. 86.676×10^{-9}
c. 8.6676×10^{9}
d. 0.86676×10^{-9}

* Remember scientific notation is only time neg. exp. are ok! *

Solve the equation by completing the square.

C 43. $x^2 + 8x + 15 = 0$

a. {3, 5}
b. {–10, –3}
c. {–5, –3}
d. {–10, –6}

X 44. Find the slope of the line that passes through the pair of points (–10, 2.75) and (–0.85, 11.3).

a. 0.17
b. 0.93
c. 1.49
d. 1.07

$\frac{8}{2} = 4^2 = 16$

$x^2 + 8x + 16 = -15 + 16$

$(x+4)^2 = 1$

$x + 4 = \pm\sqrt{1}$

$x = -4 \pm \sqrt{1}$

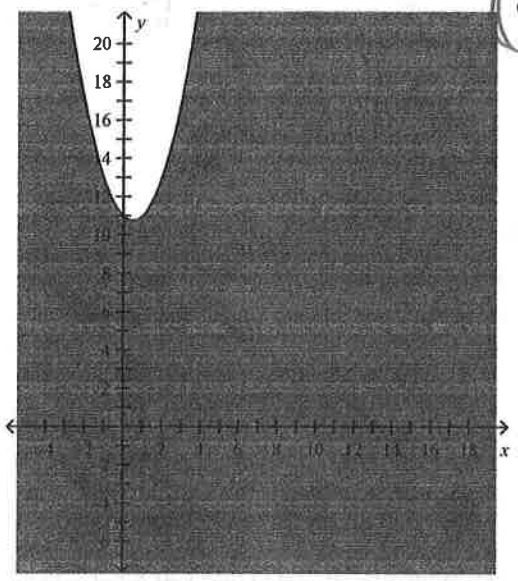
$(x+5)(x+3) = 0$

$x = -5 \quad x = -3$

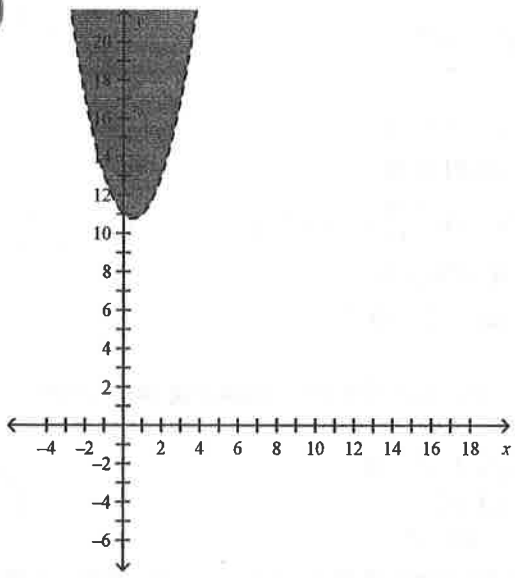
C

45. $y > x^2 - 1x + 11$

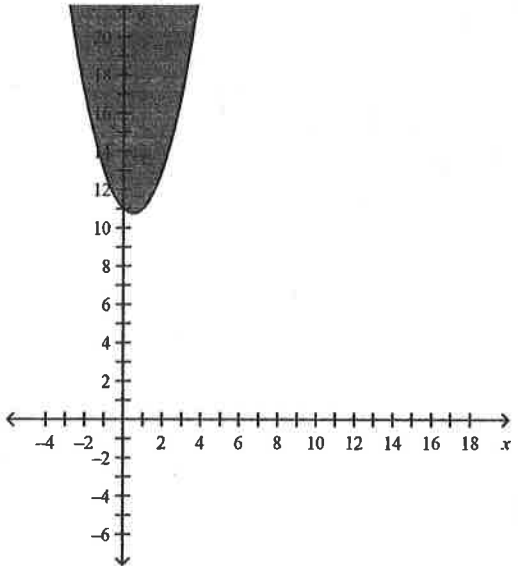
a.



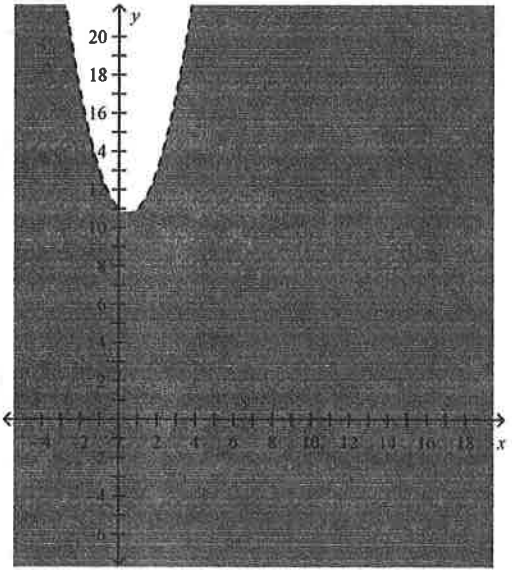
c.



b.



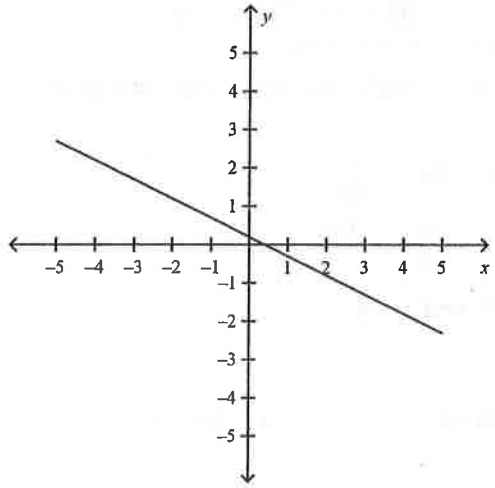
d.



Name: _____ **ID: C**

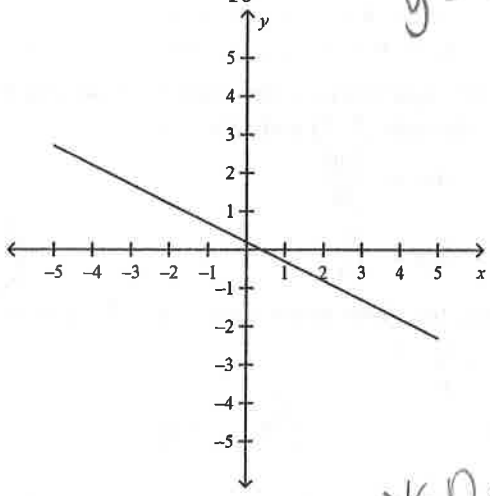
B 46. Find the x-intercept and the y-intercept of the graph of the equation $10x + 20y = 4$. Then graph the equation.

a. The x-intercept is $-\frac{20}{10}$.
The y-intercept is $-\frac{4}{20}$.

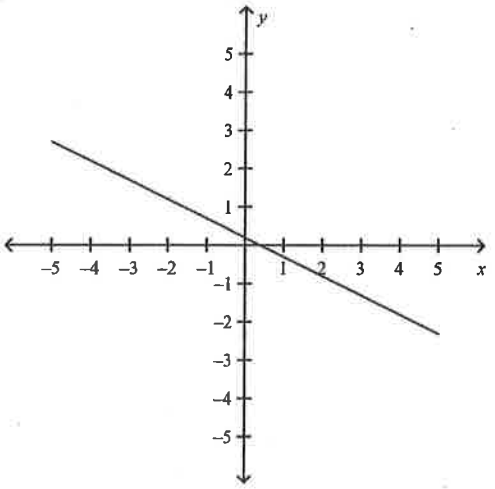


c. The x-intercept is $\frac{10}{20}$.
The y-intercept is $\frac{4}{10}$.

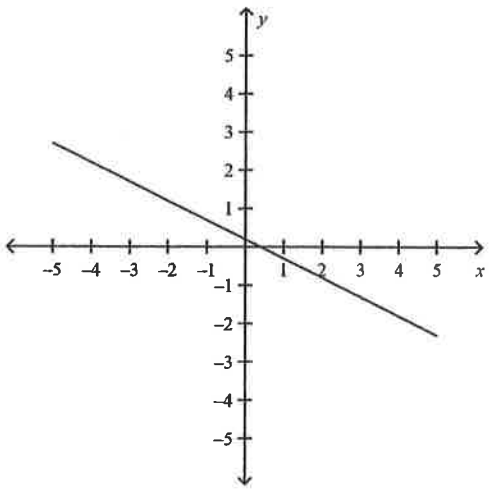
$20y = -10x + 4$
$y = -\frac{1}{2}x + \frac{1}{5}$



(b.) The x-intercept is $\frac{4}{10}$.
The y-intercept is $\frac{4}{20}$.



d. The x-intercept is $-\frac{4}{20}$.
The y-intercept is $-\frac{4}{10}$.



*Reduce all fractions!

Find the value of the given expression.

B 47. $\frac{1}{2}[32 + (40(-42))]$

$32 - 1680 = (-1648)\frac{1}{2} =$

a. −1648 (b.) −824 c. 15 d. 219

Name: _____ ID: C

Solve the given system of equations.

A 48. $-8a = 12$ $a = -1.5$
$4a + 8c = 0$ $4(-1.5) + 8c = 0$ $8c = 6$ $c = .75$
$7b + 1c = 18$ $7b + .75 = 18$ $7b = 17.25$ $b = 2.46$

a. $a = -1.50, b = 2.46, c = 0.75$
b. $a = 0.75, b = -1.50, c = 2.46$
c. $a = -1.50, b = 0.75, c = 2.46$
d. $a = 1.50, b = 2.46, c = 0.75$

D 49. Write an equation in slope-intercept form for the line that satisfies the following condition.
passes through (2, 7) and (26, 21)

$m = \frac{21-7}{26-2} = \frac{14}{24} = \frac{7}{12}$

$7 = 7/12(2) + b$

$7 = 14/12 + b$

$b = 5\frac{5}{6} = 35/6$

a. $y = 10x + \frac{140}{24}$
b. $y = 24x + \frac{1}{10}$
c. $y = 14x + \frac{1}{10}$
d. $y = \frac{14}{24}x + \frac{140}{24}$

B 50. Evaluate the given expression if $w = 17$, $x = 29$, $y = 48$, and $z = 8$.
$w + \frac{1}{x} + \frac{1}{y} + \frac{1}{z}$

a. 8.11
b. 17.18
c. 46.15
d. 94.13

$17 + \frac{1}{29} + \frac{1}{48} + \frac{1}{8}$