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Algebra 2 2nd Semester Review 2

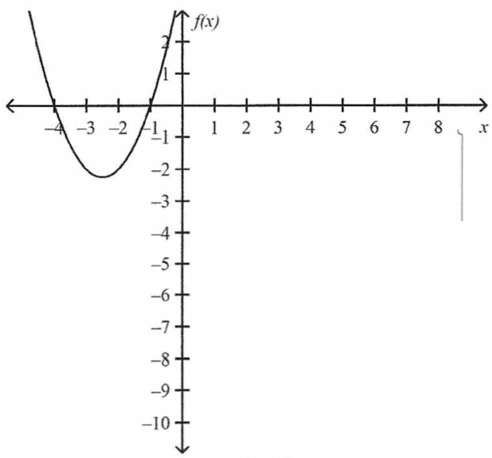
Multiple Choice

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

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

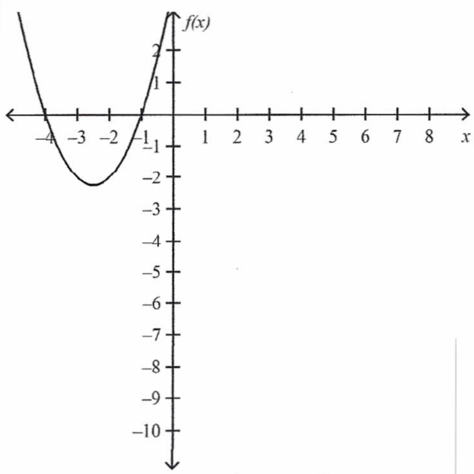
B 1. $x^2 + 5x + 4 = 0$ Calc.

a.



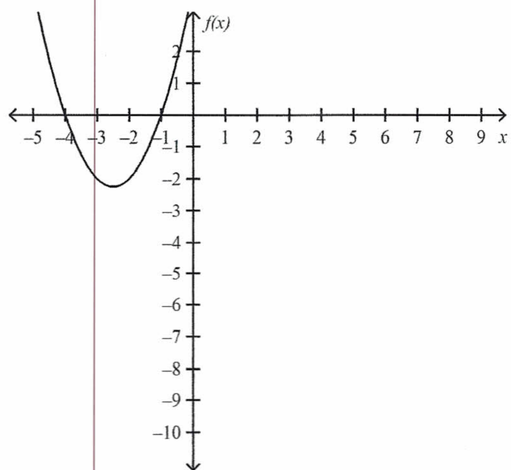
The solution set is $\{1, 4\}$.

b.



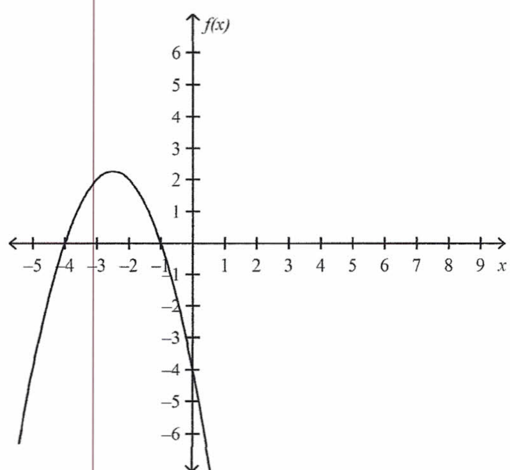
The solution set is $\{-4, -1\}$.

c.



The solution set is $\{-2.5, -2.25\}$.

d.



The solution set is $\{1, 4\}$.

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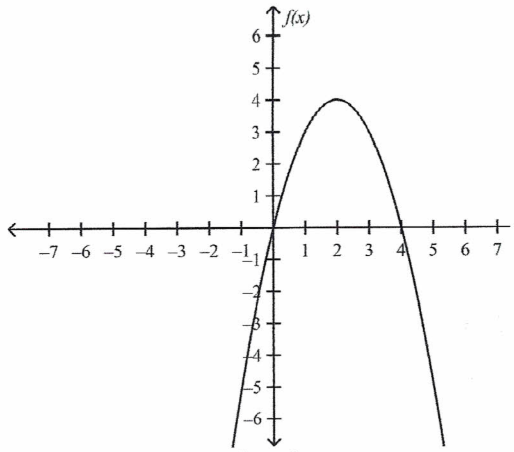
A 2. $-x^2 + 4x = 0$ $-x(x-4)=0 \quad -x=0 \quad x-4=0 \quad x=0 \quad x=4$

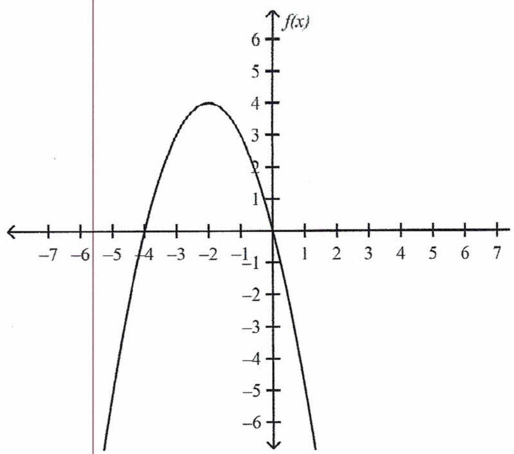
a.

opens Down



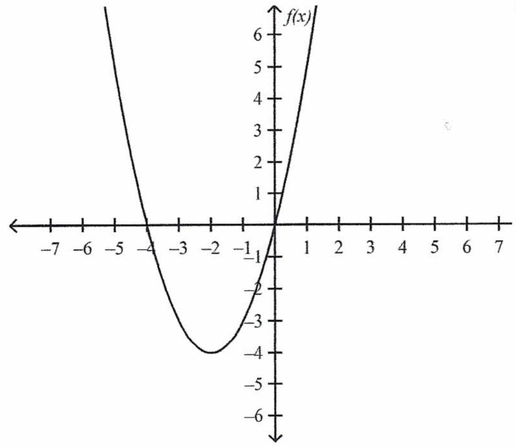
The solution set is $\{0, 4\}$.

c.



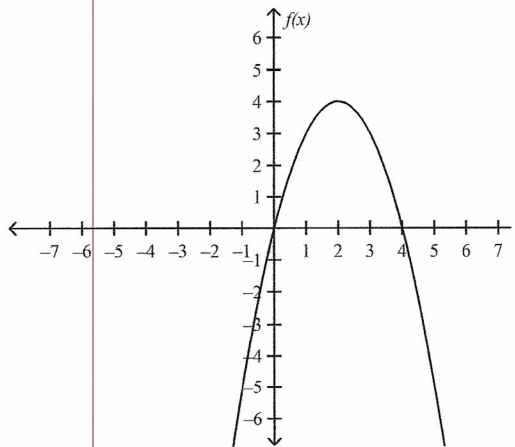
The solution set is $\{-4, 0\}$.

b.



The solution set is $\{-4\ 0\}$.

d.



The solution set is $\{2, 4\}$.

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.

$x=-5 \quad x=2$
$+5 \quad +5 \quad -2 \quad -2$
$(x+5)(x-2)=0$

D 3. -5 and 2

a. $x^2 - 7x + 10 = 0$

b. $x^2 + 7x + 10 = 0$

c. $x^2 - 3x + 10 = 0$

d. $x^2 + 3x - 10 = 0$

$x^2-2x+5x-10=0$
$x^2+3x-10$

A 4. $-\frac{5}{4}$ and 8

a. $4x^2 - 27x - 40 = 0$

b. $4x^2 + 27x + 40 = 0$

c. $x^2 - 27x - 40 = 0$

d. $x^2 - 27x + 40 = 0$

$x = -\frac{5}{4} \quad x=8$
$-8 \quad -8$
$4x=-5 \quad x-8=0$
$+5 \quad +5$
$4x+5=0$

$(4x+5)(x-8)=0$
$4x^2-32x+5x-40=0$
$4x^2-27x-40=0$

Solve the equation by factoring.

B 5. $2x^2 + 3x - 14 = 0$

x	+
−28	3
7x=4	7+−4

a. $\{-4, -\frac{7}{2}\}$ c. $\{-4, 7\}$

b. $\{-\frac{7}{2}, 2\}$ d. $\{2, 7\}$

$x = \frac{-7}{2}$ $x = \frac{4}{2}$

$x = 2$

Simplify.

C 6. $(2i)(-3i)(4i)$

$-6i^2(4i)$

$6(4i)$

$24i$

a. -24 c. $24i$

b. $-24i$ d. 24

A 7. i^7

a. $-i$ c. i

b. 1 d. -1

$i = i$ $i^5 = i^4 i = 1 \cdot i = i$

$i^2 = -1$ $i^6 = -1$

$i^3 = i^2 i = -1 \cdot i = -i$ $i^7 = -i$

$i^4 = i^2 i^2 = -1 \cdot -1 = 1$

A 8. $(11 + i) + (3 - 15i)$

$11 + i + 3 - 15i$

$14 - 14i$

a. $14 - 14i$ c. $12 - 12i$

b. $-4 + 4i$ d. $14 + 16i$

B 9. $(8 + 10i)(5 - 8i)$

$40 - 64i + 50i - 80i^2 \rightarrow 40 - 14i + 80 \rightarrow 120 - 14i$

a. $40 - 14i + 80$ c. $40 - 14i - 80i^2$

b. $120 - 14i$ d. $88 + 50i$

D 10. $\frac{3}{6 + 7i} \cdot \frac{(6-7i)}{(6-7i)} = \frac{18-21i}{36-49i^2}$

$\frac{18-21i}{36+49}$

$\frac{18-21i}{85}$ Split

a. $\frac{18}{85} + \frac{21}{85}i$ c. $\frac{18}{13} + \frac{21}{13}i$

b. $\frac{6}{85} - \frac{7}{85}i$ d. $\frac{18}{85} - \frac{21}{85}i$

A 11. $\frac{6 - 3i}{8 - 11i}$

$\frac{6-3i}{8-11i} \cdot \frac{(8+11i)}{(8+11i)} \rightarrow \frac{48+42i+33}{64+121}$

$\frac{48+66i-24i-33i^2}{64-121i^2}$

$\frac{81+42i}{185}$

Split

a. $\frac{81}{185} + \frac{42}{185}i$ c. $\frac{6}{185} - \frac{3}{185}i$

b. $\frac{15}{57} + \frac{42}{57}i$ d. $\frac{81}{185} - \frac{42}{185}i$

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

D 12. $-x^2 + 3x + 7 = 0$

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$x = \frac{-3 \pm \sqrt{3^2 - 4(-1)(7)}}{2(-1)}$

$x = \frac{-3 \pm \sqrt{37}}{-2}$

a. $\left\{\frac{3-\sqrt{37}}{-2}, \frac{3+\sqrt{37}}{-2}\right\}$ c. $\left\{\frac{-3-\sqrt{-19}}{-2}, \frac{-3+\sqrt{-19}}{-2}\right\}$

b. $\left\{\frac{-3-\sqrt{12}}{-2}, \frac{-3+\sqrt{12}}{-2}\right\}$ d. $\left\{\frac{-3-\sqrt{37}}{-2}, \frac{-3+\sqrt{37}}{-2}\right\}$

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

C 13. $-x^2 - 14x + 2 = 0$

$b^2 - 4ac$ $(-14)^2 - 4(-1)(2)$ $196 + 8 = 204 > 0$ not a perfect sq. 2 Real Irrat.

a. The discriminant is 196. Because the discriminant is greater than 0 and is a perfect square, the two roots are real and rational.
b. The discriminant is –204. Because the discriminant is less than 0, the two roots are complex.
c. The discriminant is 204. Because the discriminant is greater than 0 and is not a perfect square, the two roots are real and irrational.
d. The discriminant is –188. Because the discriminant is less than 0, the two roots are complex.

C 14. $x^2 + x + 7 = 0$

$(1)^2 - 4(1)(7)$ $1 - 28 = -27 < 0$ 2 complex - Imag.

a. The discriminant is –29.
Because the discriminant is less than 0, the two roots are complex.
b. The discriminant is 1.
Because the discriminant is greater than 0 and is a perfect square, the two roots are real and rational.
c. The discriminant is –27.
Because the discriminant is less than 0, the two roots are complex.
d. The discriminant is 27.
Because the discriminant is greater than 0 and is a perfect square, the two roots are real and rational.

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

A 15. $y = x^2 + 4x - 6$

$y + 6 = x^2 + 4x + \underline{4}$
$+4$
$y + 10 = (x+2)^2$
$y = (x+2)^2 - 10$
$x = -2$

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 $x = -2$.
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 $x = -10$.

Solve the inequality algebraically.

C 16. $2x^2 + 14x < -12$

a. $\{x \mid -1 < x - 6\}$
b. $\{x \mid -12 < x < -2\}$
c. $\{x \mid -6 < x < -1\}$
d. $\{x \mid -2 < x < -12\}$

$2x^2 + 14x + 12 < 0$ ÷ by 2

$x^2 + 7x + 6 < 0$

$x = -6$ $x = -1$

$\begin{array}{c|c} \times & + \\ 6 & 7 \end{array}$

$6 \cdot 1$ $6 + 1$

$- - 0 + - 0 + +$

$+$ -6 $-$ -1 $+$

$-6 < x < -1$

OR graph and determine the values of x where the curve is below the x-axis.

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

No correct answer available 17. $14x\left(4xy^{14}\right)\left(-4x^{-10}y^{7}\right)$ $= 56x^2y^{14}\left(-4x^{-10}y^7\right) = -224x^{-8}y^{21}$

$\boxed{\dfrac{-224y^{21}}{x^8}}$

a. $-224x^{-11}y^{-110}$
b. $\dfrac{-224y^{21}}{x^{9}}$
c. $\dfrac{14y^{21}}{x^{9}}$
d. $-224x^{-9}y^{21}$

D 18. $\left(\dfrac{20x^{20}y^{9}}{40x^{7}y^{13}}\right)^{4}$ $= \left(\dfrac{x^{13}}{2y^4}\right)^4 = \dfrac{x^{52}}{16y^{16}}$

a. $\dfrac{x^{52}}{2y^{16}}$
b. $\dfrac{x^{52}y^{-16}}{16}$
c. $\dfrac{x^{13}}{16y^{4}}$
d. $\dfrac{x^{52}}{16y^{16}}$

Simplify the expression using long division.

B 19. $(2x^2 - 33x + 16) \div (x - 16)$

a. quotient $2x - 33$ and remainder 16
b. quotient $2x - 1$ and remainder 0
c. quotient $2x - 1$ and remainder -32
d. quotient $2x + 1$ and remainder 32

$2x - 1$
$x-16 \,\overline{)\, 2x^2 - 33x + 16}$
$\ominus\; 2x^2 - 32x$
$-x + 16$
$\ominus\; -x + 16$
0

Simplify the expression using synthetic division.

B 20. $(6x^3 - 48x^2 + 120x - 96) \div (x - 4)$

a. quotient $\left(24x^2 + 48x + 312\right)$ and remainder 1,152
b. quotient $\left(6x^2 - 24x + 24\right)$ and remainder 0
c. quotient $\left(30x^2 + 72x - 408\right)$ and remainder 1,536
d. quotient $\left(6x^2 - 72x - 168\right)$ and remainder 576

4 | 6 −48 120 −96
24 −96 96
6 −24 24 | 0

$6x^2 - 24x + 24$

B 21. Find $p(-3)$ and $p(5)$ for the function $p(x) = 4x^4 + 8x^3 - 2x^2 + 13x + 10$.

$p(-3) = 4(-3)^4 + 8(-3)^3 - 2(-3)^2 + 13(-2) + 10$
$p(-3) =$ 61

a. 51; 3,515
b. 61; 3,525
c. −371; 1,525
d. 113; 3,473

$p(5) = 4(5)^4 + 8(5)^3 - 2(5)^2 + 13(5) + 10 =$ ____
$= 3525$

B 22. Use synthetic substitution to find $g(2)$ and $g(-7)$ for the function $g(x) = 5x^4 - 3x^2 + 6x - 4$.

a. 100, 2,216
b. 76, 11,812
c. 84, 11,896
d. 36, −536

2 | 5 0 −3 6 −4
10 20 34 80
5 10 17 40 76

−7 | 5 0 −3 6 −4
−35 245 −1694 11816
5 −35 242 −1688 11812

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Given a polynomial and one of its factors, find the remaining factors of the polynomial. Some of the factors may not be binomials.

A 23. $16x^3 - 144x^2 - 81x + 729$; $x - 9$

a. $(4x - 9)(4x + 9)$ c. $(4x - 9)$
b. $(16x^2 - 81)$ d. $(4x - 9)(4x - 9)$

$$\begin{array}{r|rrrr} 9 & 16 & -144 & -81 & 729 \\ & & 144 & 0 & -729 \\ \hline & 16 & 0 & -81 & 0 \end{array}$$

$16x^2 - 81 = 0$ Differ. of Sq.

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

C 24. $36x^3 + 60x^2 - 143x - 242$; $x - 2$

a. $(6x - 11)^2$ c. $(6x + 11)(6x + 11)$
b. $2(6x + 11)$ d. $(6x + 11)(6x - 11)$

$$\begin{array}{r|rrrr} 2 & 36 & 60 & -143 & -242 \\ & & 72 & 264 & 242 \\ \hline & 36 & 132 & 121 & 0 \end{array}$$

$36x^2 + 132x + 121 = 0$

$(6x+11)(6x+11)=0$

A 25. Find all of the zeros of the function $f(x) = x^3 - 15x^2 + 73x - 111$.

a. $3, 6 - i, 6 + i$ c. $3, 6 - i$
b. $6 - i, 6 + i$ d. $-3, 6 - i, 6 + i$

graph to find 1st zero x=3 other 2 are imag.

B 26. Find $[g \circ h](x)$ and $[h \circ g](x)$.

$g(x) = 3x$

$h(x) = -6x - 5$

$[g \circ h](x) = 3(-6x-5) = -18x-15$ $[h \circ g](x) = -6(3x)-5 = -18x-5$

a. $[g \circ h](x) = -18x^2 - 15x$, $[h \circ g](x) = -18x^2 - 5x$
b. $[g \circ h](x) = -18x - 15$, $[h \circ g](x) = -18x - 5$
c. $[g \circ h](x) = -18x + 15$, $[h \circ g](x) = -18x + 5$
d. $[g \circ h](x) = -18x - 15$, $[h \circ g](x) = -18x - 15$

Find the inverse of the given relation.

C 27. $\{(1, -5), (12, -7), (9, -9), (16, -13)\}$

Interchange x and y

a. $\{(-5, 1), (7, -12), (-9, 9), (-13, 16)\}$
b. $\{(-5, 1), (-7, 12), (-9, -9), (-13, 16)\}$
c. $\{(-5, 1), (-7, 12), (-9, 9), (-13, 16)\}$
d. $\{(-5, 1), (-7, 12), (-9, 9), (-13, -16)\}$

Find the inverse of the given function.

B 28. $f(x) = \dfrac{7x - 3}{16}$

a. $f^{-1}(x) = \dfrac{16x - 3}{7}$ c. $f^{-1}(x) = \dfrac{7x + 16}{3}$
b. $f^{-1}(x) = \dfrac{16x + 3}{7}$ d. $f^{-1}(x) = \dfrac{7x - 16}{3}$

$x = \dfrac{7y-3}{16}$

$16x = 7y - 3$

$16x + 3 = 7y$

$y = \dfrac{16x+3}{7}$

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D 29. Determine whether each pair of functions are inverse functions.

1) $f(x) = \dfrac{11x+4}{4}$ 2) $f(x) = x - 8$

$g(x) = \dfrac{9x-6}{11}$ $g(x) = x + 8$

a. Only 1 is an inverse function.
b. Neither 1 nor 2 is an inverse function.
c. Both 1 and 2 are inverse functions.
d. Only 2 is an inverse function.

① $f(g(x)) = \dfrac{11\left(\frac{9x-6}{11}\right)+4}{4} = \dfrac{9x-6+4}{4} = \dfrac{9x-2}{4} \neq x$

② $f(g(x)) = (x+8)-8 = x$

$g(f(x)) = (x-8)+8 = x$

Solve the given equation.

A 30. $2^{9n-11} = \dfrac{1}{16}$

a. $n = \dfrac{7}{9}$ c. $n = \dfrac{8}{9}$

b. $n = \dfrac{5}{3}$ d. $n = 7$

$2^{9n-11} = 16^{-1}$

$2^{9n-11} = (2^4)^{-1}$

$2^{9n-11} = 2^{-4}$

$9n - 11 = -4$

$9n = 7$

$n = 7/9$

C 31. $6^{5n+6} = 1{,}296$

a. $n = -\dfrac{3}{5}$ c. $n = -\dfrac{2}{5}$

b. $n = -2$ d. $n = 2$

$6^{5n+6} = 6^4$

$5n + 6 = 4$

$5n = -2$

$n = -2/5$

C 32. $\dfrac{x}{x+2} = \dfrac{2}{19}$

a. 2.24 c. 0.24

b. 0.21 d. 0.19

$19x = 2x + 4$

$17x = 4$ $x = 4/17$

$x = 0.24$

Evaluate the logarithmic expression.

D 33. $\log_8 32{,}768$

a. 5^8 c. $8^{32{,}768}$

b. 32,768 d. 5

Calc → log(32,768) / log(8)

or $\log_8 32768 = x$ $8^x = 32{,}768$

$8^x = 8^5$

$x = 5$

D 34. $\log_9 \dfrac{1}{729}$

a. 3 c. $9^{\frac{1}{729}}$

b. 9^3 d. -3

Calc → log(1/729) / log(9)

or $\log_9 \frac{1}{729} = x$

$9^x = \frac{1}{729}$

$9^x = (729)^{-1}$

$9^x = (9^3)^{-1}$

$x = -3$

D 35. Solve $\log_8 n = \dfrac{4}{3}$.

a. $\dfrac{4}{3}$ c. 8

b. $\dfrac{32}{3}$ d. 16

$8^{4/3} = n$

$(8^{1/3})^4 = n$

$2^4 = n$

$16 = n$

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D 36. Solve $\log_3 x = 6$.

$3^6 = x$

a. 18
b. 216
c. 6
d. 729

Solve the given equation. If necessary, round to four decimal places.

B 37. $\log_2 9 + \log_2 a = \log_2 13$

a. 26
b. 1.4444
c. 0.69
d. 4

$\log_2(9a) = \log_2 13$
$9a = 13$
$a = 13/9$

B 38. $\log_5 (x+2) - \log_5 11 = \log_5 121$

a. 9
b. 1,329
c. 130
d. 1,331

$\log_5\left(\frac{x+2}{11}\right) = \log_5 121$
$\frac{x+2}{11} = 121$
$x + 2 = 1331 \quad x = 1329$

C 39. $13^y = 21$

$\ln 13^y = \ln 21$
$y \ln 13 = \ln 21$
$y = \frac{\ln 21}{\ln 13}$

a. 18.8519
b. 0.2083
c. 1.1870
d. 3.0445

D 40. Evaluate the expression $\ln e^2$.

$\ln e^2$
$2 \ln e \quad \ln e = 1 \quad 2 \cdot 1 = 2$

a. e^2
b. 2^e
c. $\ln 2^e$
d. 2

B 41. Evaluate the expression $e^{\ln 14}$.

a. $\ln 14^e$
b. 14
c. $\ln^{e14}$
d. e^{14}

$\ln e^{\ln 14} = \ln x$
$\ln(14) \ln e = \ln x$
$\ln 14 = \ln x \quad x = 14$

Simplify the given expression.

C 42. $\frac{\cancel{12x}}{\cancel{2y}} \cdot \frac{3\cancel{y^2}}{\cancel{24x^3}} = \frac{3y}{4x^2}$

LCD: $24x^3y$

a. $\frac{3y}{4x}$
b. $\frac{3y^2}{4x^2}$
c. $\frac{3y}{4x^2}$
d. $\frac{4y}{3x^2}$

C 43. $\frac{5x^2y^3}{3a^5b^4} \div \frac{23x^5y}{42\ a^7b^3}$

$\frac{5\cancel{x^2}\cancel{y^3}}{\cancel{3a^5b^4}} \cdot \frac{\cancel{42a^7b^3}}{23\cancel{x^5}\cancel{y}} = \frac{70y^2a^2}{23x^3b}$

a. $\frac{70ya^2}{23x^3b}$
b. $\frac{70y^2a}{23x^3b}$
c. $\frac{70y^2a^2}{23x^3b}$
d. $\frac{70y^2a^2}{23x^3}$

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B 44. $\dfrac{5(a^2+5a+6)}{3(a^2-36)} \div \dfrac{41(a+3)}{6(a+6)}$ $\Rightarrow \dfrac{5(\cancel{a+3})(a+2)}{3(\cancel{a+6})(a-6)} \cdot \dfrac{\overset{2}{\cancel{6}}(\cancel{a+6})}{41(\cancel{a+3})} = \dfrac{10(a+2)}{41(a-6)}$

a. $\dfrac{10(a+3)(a-2)}{41(a-6)}$

b. $\dfrac{10(a+2)}{41(a-6)}$

c. $\dfrac{10(a+2)}{41(a+6)}$

d. $\dfrac{10(a+3)(a+2)}{41(a+6)(a-6)}$

Simplify the given expression.

C 45. $\dfrac{3}{4x^2-25} + \dfrac{2}{2x+5}$ $= \dfrac{3}{(2x+5)(2x-5)} + \dfrac{2}{2x+5} \cdot \dfrac{(2x-5)}{(2x-5)} \rightarrow \dfrac{3+4x-10}{(2x+5)(2x-5)}$ $\dfrac{4x-7}{(2x+5)(2x-5)}$

a. $\dfrac{4x+7}{(2x+5)(2x-5)}$

b. $\dfrac{4x-10}{(2x-5)(2x+5)}$

c. $\dfrac{4x-7}{(2x+5)(2x-5)}$

d. $\dfrac{5}{(4x^2+2x-20)}$

C 46. $\dfrac{19}{xy^2} - \dfrac{7y^2}{8x^2}$ LCD: $8x^2y^2$ $\dfrac{8x}{8x} \cdot \dfrac{19}{xy^2} - \dfrac{7y^2}{8x^2} \cdot \dfrac{y^2}{y^2}$ $\dfrac{152x-7y^4}{8x^2y^2}$

a. $\dfrac{19-7y^2}{8x^2y^2}$

b. $\dfrac{152x-7xy^2}{8x^2y^2}$

c. $\dfrac{152x-7y^4}{8x^2y^2}$

d. $\dfrac{152x-7xy^4}{8x^3y^2}$

C 47. If y varies directly as x and $y = 30$ when $x = -10$, find y when $x = 56$. $\dfrac{y_1}{x_1} = \dfrac{y_2}{x_2}$ $\dfrac{30}{-10} = \dfrac{y}{56}$ $-10y = 1680$ $y = -168$

a. 168

b. 16,800

c. –168

d. –16,800

D 48. Suppose y varies jointly as x and z. Find y when $x = 2$ and $z = 11$, if $y = 160$ when $x = 3$ and $z = 8$. Round your answer to the nearest hundredth, if necessary.

$y = kxz$ $160 = k(2)(11)$ $k = 160/22$ $k = \frac{80}{11}$ $y = \frac{80}{11}(3)(8)$ $y = 174.55$

a. 1,173.33

b. 146.67

c. 13.33

d. 174.55

D 49. If y varies inversely as x and $y = 194$ when $x = -13$, find y when $x = 50$. Round your answer to the nearest hundredth, if necessary.

$\dfrac{y_1}{x_2} = \dfrac{y_2}{x_1}$ $\dfrac{194}{50} = \dfrac{y}{-13}$ $50y = 2522$ $y = -50.44$

a. –746.15

b. 746.15

c. 50.44

d. –50.44

Find the midpoint of the line segment with endpoints at the given coordinates.

A 50. $(-2, 8)$ and $(-4, -9)$ ($x_1\ y_1$, $x_2\ y_2$)

M.P. $= \left(\dfrac{x_1+x_2}{2}, \dfrac{y_1+y_2}{2}\right) = \left(\dfrac{-2+(-4)}{2}, \dfrac{8+(-9)}{2}\right) = \left(\dfrac{-6}{2}, \dfrac{-1}{2}\right) = \left(-3, -\frac{1}{2}\right)$

a. $(-3, -\frac{1}{2})$

b. $(1, \frac{17}{2})$

c. $(-6, -1)$

d. $(-\frac{11}{2}, -2)$

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Find the distance between the pair of points with the given coordinates.

$x_1 \; y_1 \quad x_2 \; y_2$

C 51. $(-11, 10)$ and $(1, -8)$

a. 18
b. $\sqrt{30}$
c. $6\sqrt{13}$
d. $2\sqrt{106}$

$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

$d = \sqrt{(1-(-11))^2 + (-8-10)^2}$

$d = \sqrt{12^2 + (-18)^2}$

$d = \sqrt{144+324} = \sqrt{468} = \sqrt{36 \cdot 13} = 6\sqrt{13}$

Write the equation in the standard form for a parabola.

A 52. $y = 6x^2 - 48x + 100$

a. $y = 6(x-4)^2 + 4$
b. $y = 6(x-4)^2 + 68$
c. $y = 6(x-4)^2$
d. $y = 6(x^2 - 8x) + 100$

$y - 100 = 6x^2 - 48x$

$y - 100 + \underline{6 \cdot 16} = 6(x^2 - 8x + \underline{16})$

$y - 4 = 6(x-4)^2$

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

Write the equation for a circle that satisfies the given conditions.

D 53. center $(-10, -6)$, radius 9 units

a. $(x+10)^2 + (y+6)^2 = 9$
b. $(x+10)^2 + (y-6)^2 = 81$
c. $(x-10)^2 + (y+6)^2 = 81$
d. $(x+10)^2 + (y+6)^2 = 81$

$(x+10)^2 + (y+6)^2 = 81$

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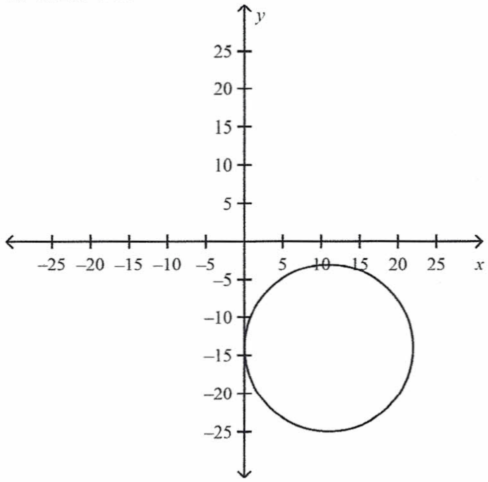
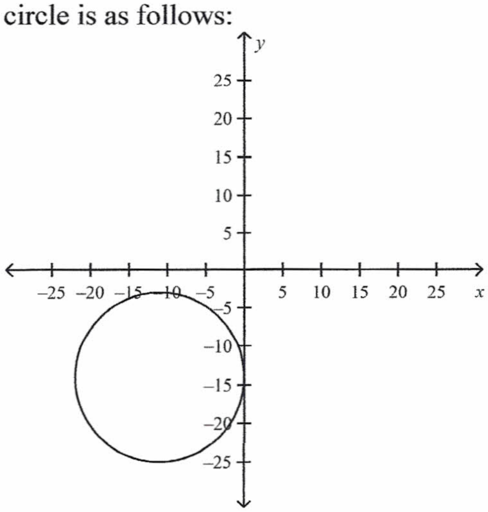
Find the center and radius of a circle with the given equation and then graph the circle.

C 54. $x^2 + y^2 + 22x - 28y + 196 = 0$

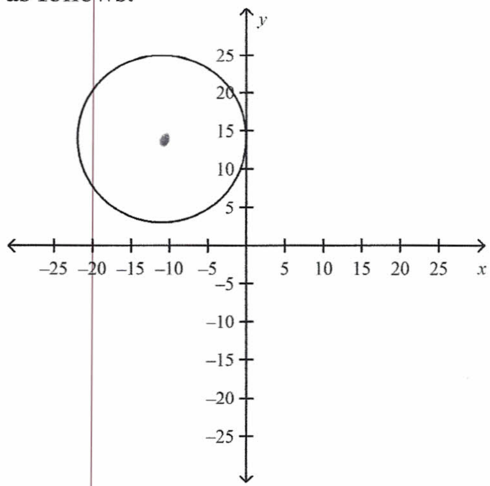
a. The center of the circle is $(11, -14)$ and the radius is 11. The graph of the circle is as follows:



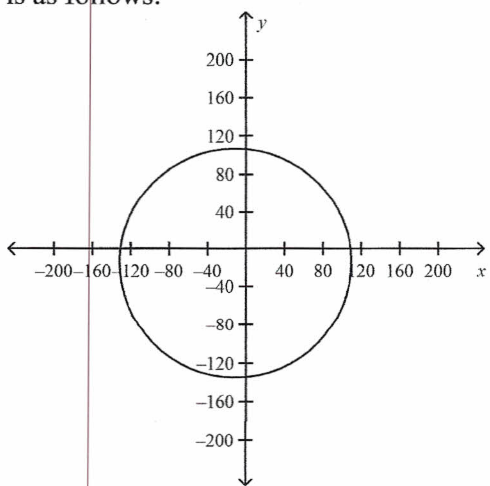
b. The center of the circle is $(-11, -14)$ and the radius is 11. The graph of the circle is as follows:



c. The center of the circle is $(-11, 14)$ and the radius is 11. The graph of the circle is as follows:



d. The center of the circle is $(-11, 14)$ and the radius is 121. The graph of the circle is as follows:



$x^2 + 22x + \underline{121} + y^2 - 28y + \underline{196} = -196 + \underline{121} + \underline{196}$

$(x+11)^2 + (y-14)^2 = 121$

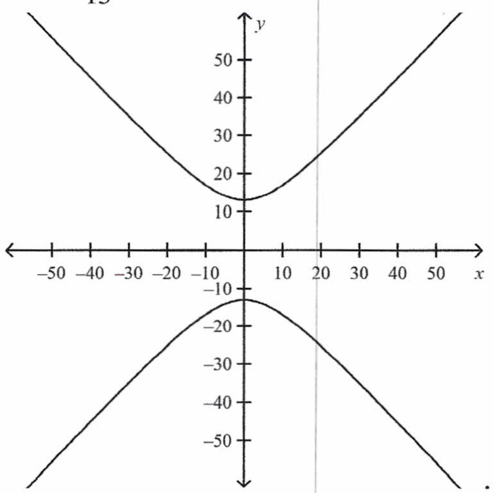
Center $(-11, 14)$ $r = 11$

Name: ______________________ **ID: A**

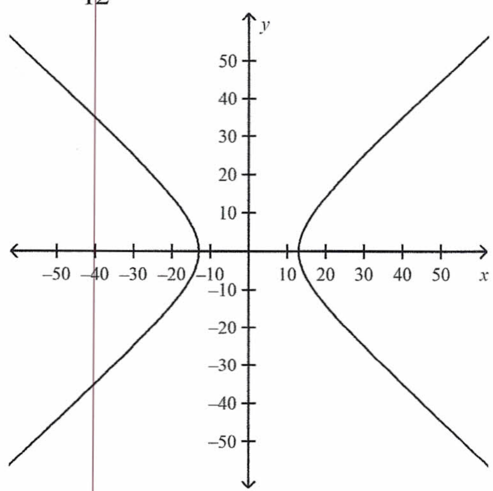
Find the coordinates of the vertices and foci and the equations of the asymptotes for the hyperbola. Then graph the hyperbola.

B 55. $\dfrac{x^2}{169} - \dfrac{y^2}{144} = 1$ Horizontal $a = \sqrt{169} = 13$ Center $(0,0)$ Vertices $(13,0)\ (-13,0)$

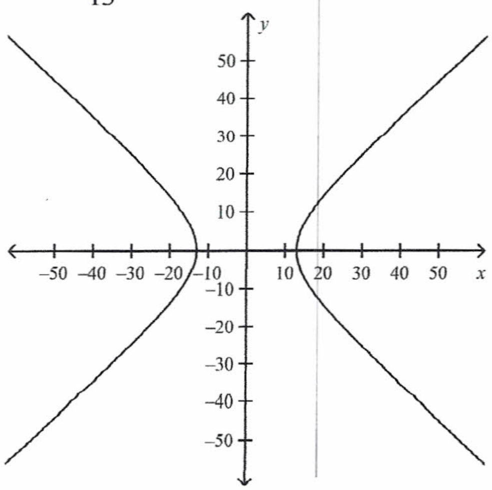
a. The coordinates of the vertices are $(\pm 13, 0)$.
The coordinates of the foci are $(0, \pm\sqrt{313})$.
The equation of the asymptotes is $y = \pm\dfrac{12}{13}x$



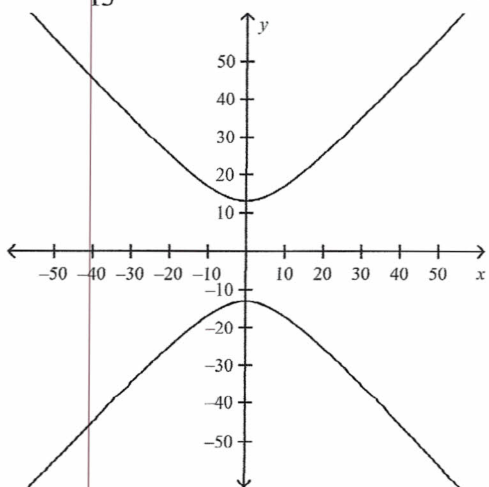
c. The coordinates of the vertices are $(\pm 13, 0)$
The coordinates of the foci are $(\pm\sqrt{313}, 0)$.
The equation of the asymptotes is $y = \pm\dfrac{13}{12}x$.



b. The coordinates of the vertices are $(\pm 13, 0)$.
The coordinates of the foci are $(\pm\sqrt{313}, 0)$.
The equation of the asymptotes is $y = \pm\dfrac{12}{13}x$.



d. The coordinates of the vertices are $(0, \pm 13)$.
The coordinates of the foci are $(0, \pm\sqrt{313})$.
The equation of the asymptotes is $y = \pm\dfrac{12}{13}x$.



The answer is B. Since the hyperbola is horizontal, the foci must also be in the x-direction choice has them in the y-direction.

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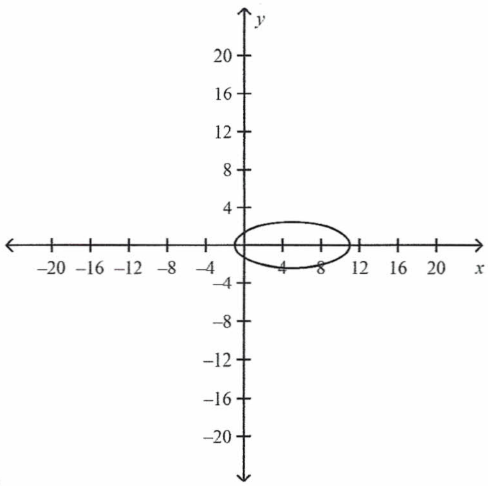
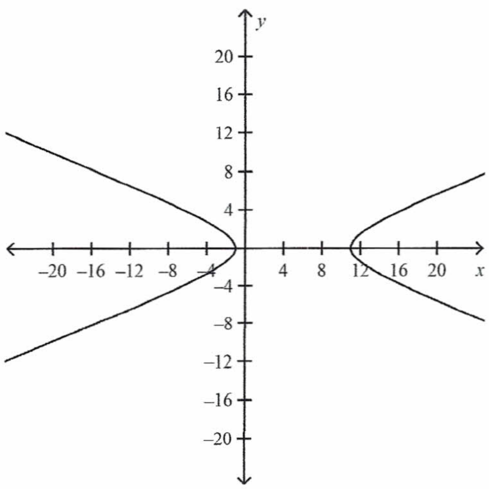
Write the equation in standard form. State whether the graph of the equation is a parabola, circle, ellipse, *or* hyperbola. *Then graph the equation.*

A 56. $x^2 + 6y^2 - 10x - 11 = 0$

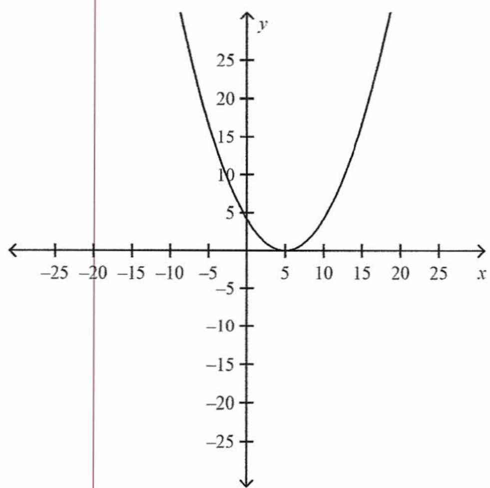
a. The equation in standard form is $\dfrac{(x-5)^2}{36} + \dfrac{y^2}{6} = 1$. The graph of the equation is an ellipse.



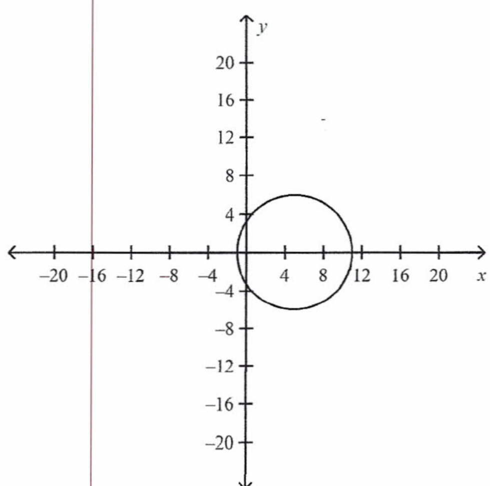
b. The equation in standard form is $\dfrac{(x-5)^2}{36} - \dfrac{y^2}{6} = 1$. The graph of the equation is a hyperbola.



c. The equation in standard form is $(x-5)^2 = 6y^2$. The graph of the equation is a parabola.



d. The equation in standard form is $(x-5)^2 + y^2 = 36$. The graph of the equation is a circle.



$x^2 - 10x + \underline{25} + 6y^2 = 11 + \underline{25}$

$(x-5)^2 + 6y^2 = 36$

$\dfrac{(x-5)^2}{36} + \dfrac{y^2}{6} = 1$ Ellipse

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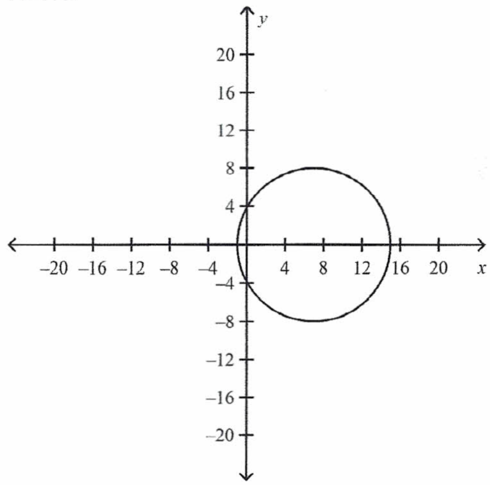
D 57. $x^2 - 8y^2 - 14x - 15 = 0$

$x^2 - 14x + \underline{49} - 8y^2 = 15 + \underline{49}$

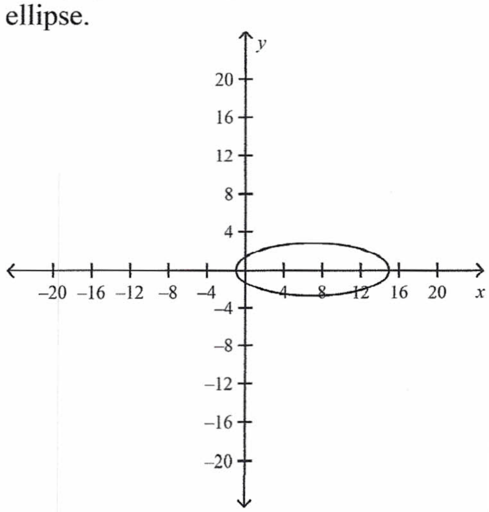
$(x-7)^2 - 8y^2 = 64$

$\frac{(x-7)^2}{64} - \frac{y^2}{8} = 1$

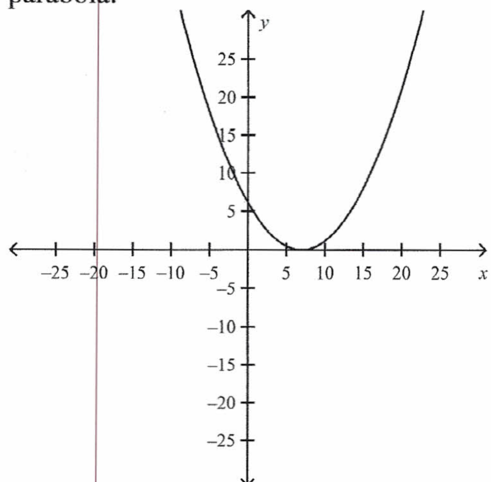
a. The equation in standard form is $(x-7)^2 + y^2 = 64$. The graph of the equation is a *circle.*



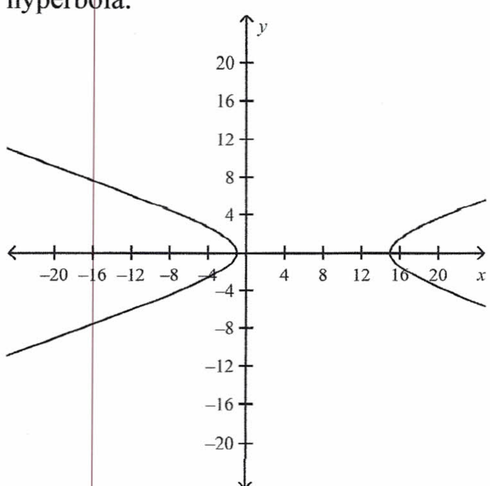
b. The equation in standard form is $\frac{(x-7)^2}{64} + \frac{y^2}{8} = 1$. The graph of the equation is an ellipse.



c. The equation in standard form is $(x-7)^2 = 8y^2$. The graph of the equation is a parabola.



d. The equation in standard form is $\frac{(x-7)^2}{64} - \frac{y^2}{8} = 1$. The graph of the equation is a hyperbola.



Without writing the equation in standard form, state whether the graph of the equation is a parabola, circle, ellipse, *or* hyperbola.

C 58. $x^2 + y^2 + 28x - 28y + 196 = 0$

a. parabola
b. ellipse
c. circle
d. hyperbola

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D 59. $70x^2 - 280x + 40y^2 - 80y = -20$

a. parabola
b. circle
c. hyperbola
d. ellipse

Find the exact solution(s) of the system of equations algebraically.

A 60. $y^2 + x^2 = 81$

$y^2 + 4x^2 = 81$

a. $(0, \pm 9)$
b. $(\pm 9, 0)$
c. $(0, \pm 81)$
d. $(0, 9)$

$$\begin{array}{r} y^2+x^2=81 \\ (-)\ y^2+4x^2=81 \\ \hline -3x^2=0 \\ x=0 \end{array}$$

$y^2+0^2=81$

$y^2=81$

$y=\pm 9$

$(0, \pm 9)$