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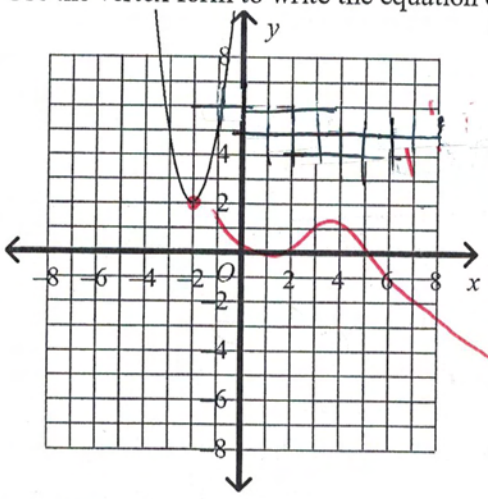
Alg 2 Topic 2 Practice

C 1. Use the vertex form to write the equation of the parabola.



$y = a(x-h)^2+k$

h, k

(−2, 2)

$y = a(x--2)^2+2$

$y = a(x+2)^2+2$

? test a point: Let X = −1: $3(-1+2)^2+2$ vs $(-1+2)^2+2$ (5 vs 3, 11 ≠ 3)

a. $y = 3(x-2)^2+2$

b. $y = 3(x-2)^2-2$

c. $y = 3(x+2)^2+2$

d. $y = (x+2)^2+2$

C 2. Suppose a parabola has vertex (−8, −7) and also passes through the point (−7, −4). Write the equation of the parabola in vertex form.

h k

$y = a(x-h)^2+k$

$-4 = a(-7-(-8))^2-7$

$-4 = a-7$

$3 = a$

x y

a. $y = (x+8)^2-7$

b. $y = 3(x-8)^2-7$

c. $y = 3(x+8)^2-7$

d. $y = 3(x+8)^2+7$

C 3. The function h is a quadratic function whose graph is a translation 7 units left and 9 units up of the parent function $f(x) = x^2$. What is the equation of h in vertex form and in the form $y = ax^2+bx+c$?

h: −7 K: 9

$y = a(x-h)^2+k$

$y = 1(x--7)^2+9$

$y = (x+7)(x+7)+9$

$= x^2+7x+7x+49+9$

a. $y = (x-7)^2+9;\ y = x^2-14x+58$

b. $y = (x-7)^2+9;\ y = x^2-14x+49$

c. $y = (x+7)^2+9;\ y = x^2+14x+58$

d. $y = (x+7)^2+9;\ y = x^2+14x+49$

C 4. What steps transform the graph of $y = x^2$ to $y = -(x+3)^2+5$?

a = −1

h: −3 K: 5

a. translate 3 units to the right, translate down 5 units

b. translate 3 units to the left, translate up 5 units

c. reflect across the x-axis, translate 3 units to the left, translate up 5 units

d. reflect across the x-axis, translate 3 units to the right, translate down 5 units

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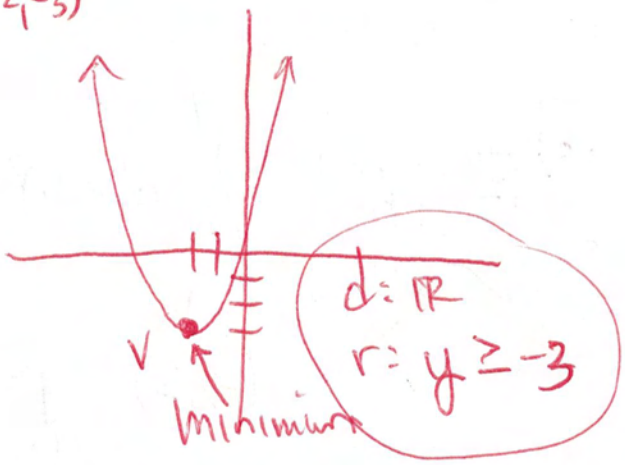
D 5. Identify the maximum or minimum value and the domain and range of the graph of the function $y = 2(x + 2)^2 - 3$.

a. minimum value: 3
domain: all real numbers ≥ 3
range: all real numbers

b. maximum value: -3
domain: all real numbers ≤ -3
range: all real numbers

c. maximum value: 3
domain: all real numbers
range: all real numbers ≤ 3

(d.) minimum value: -3
domain: all real numbers
range: all real numbers ≥ -3



C 6. Identify the vertex and the axis of symmetry of the graph of the function $y = 2(x + 2)^2 - 4$.

a. vertex: $(-2, 4)$;
axis of symmetry: $x = -2$

b. vertex: $(2, -4)$;
axis of symmetry: $x = 2$

(c.) vertex: $(-2, -4)$;
axis of symmetry: $x = -2$

d. vertex: $(2, 4)$;
axis of symmetry: $x = 2$

$a(x-h)^2+k$
V: (-2,-4)
aos: x = -2

What are the vertex and the axis of symmetry of the equation?

B 7. $y = -2x^2 + 8x - 20$

$x = \frac{-b}{2a} = \frac{-(8)}{2(-2)} = \frac{-8}{-4} = 2$

a. vertex: $(-2, 12)$
axis of symmetry: $y = -2$

(b.) vertex: $(2, -12)$
axis of symmetry: $x = 2$

aos
x = h

c. vertex: $(-2, -12)$
axis of symmetry: $x = -2$

d. vertex: $(2, -12)$
axis of symmetry: $x = -12$

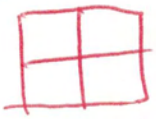
What is the expression in factored form?

B 8. $x^2 - 6x + 8$

$(x - \frac{1}{2})(x - \frac{8}{4})$

a. $(x + 4)(x + 2)$

(b.) $(x - 2)(x - 4)$



c. $(x - 4)(x + 2)$

d. $(x - 2)(x + 4)$

What is the expression in factored form?

C 9. $9x^2 - 12x + 4$

PST!
$= (3x-2)(3x-2)$

a. $(-3x - 2)^2$

b. $(-3x + 2)(3x - 2)$

2(3x · 2)

(c.) $(3x - 2)^2$

d. $(3x + 2)^2$

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C diff of squares!

10. $x^2 - 64$

a. $(-x + 8)(x - 8)$
b. $(x + 8)(-x - 8)$
c. $(x + 8)(x - 8)$
d. $(x - 8)^2$

A

11. What is an equation of a parabola with x-intercepts at (2, 0) and (–7, 0) and which passes through the point (1, 32)?

a. $y = -4(x - 2)(x + 7)$
b. $y = (x + 2)(x - 7)$
c. $y = -4(x + 2)(x - 7)$
d. $y = (x - 2)(x + 7)$

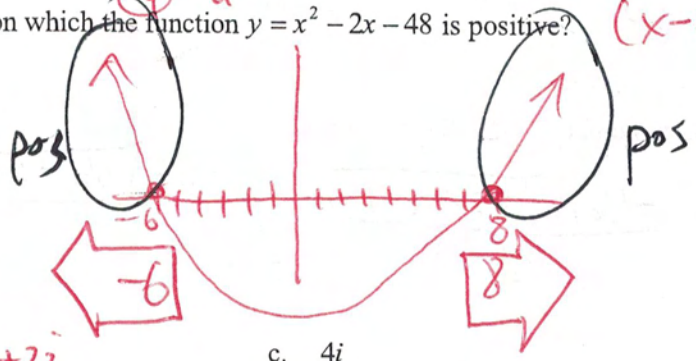
$y = a(x-p)(x-q)$
$32 = a(1-2)(1--7)$
$32 = a(-1)(8)$
$32 = -8a$
$-4 = a$

C

12. What are the interval(s) on which the function $y = x^2 - 2x - 48$ is positive?

a. $x < 6$ and $x > 8$
b. $-6 < x < 8$
c. $x > 8$ and $x < -6$
d. $6 < x < 8$

$(x-8)(x+6)$



Simplify the expression.

A

13. $(3 + i) - (2 - 2i)$

a. $1 + 3i$
b. $5 - i$
c. $4i$
d. $-1 - 3i$

$3+i-2+2i$

B

14. $(4 - i)(2 + 5i)$

a. $2(4 + 9i)$
b. $(13 + 18i)$
c. $3 + 18i$
d. $(8 + 18i)$

$8+20i-2i-5i^2 \rightarrow 8+18i+5 \rightarrow 13+18i$

C

15. $\frac{-2-3i}{0+6i}$

a. $\frac{1}{2} - \frac{1}{3}i$
b. $\frac{1}{2} + \frac{1}{3}i$
c. $-\frac{1}{2} + \frac{1}{3}i$
d. $-\frac{1}{2} + \frac{1}{3}i$

$i, -6i$
$\frac{(-2-3i)\cdot i}{6i \cdot i} \Rightarrow \frac{-2i-3i^2}{6i^2} \rightarrow -1$
$\frac{-2i+3}{-6} \Rightarrow \frac{-2i}{-6} + \frac{3}{-6}$
$\Rightarrow \frac{i}{3} - \frac{1}{2} \Rightarrow -\frac{1}{2} + \frac{1}{3}i$

What pair of factors should be used to find the complex solutions for x?

C

16. $16x^2 + 4 = 0$

a. $(4x + 2i)(4x + 2i)$
b. $(2x + 4)(2x + 4)$
c. $(4x + 2i)(4x - 2i)$
d. $(2x - 4i)(2x + 4i)$

$16x^2 - -4 = 0$ diff of squares
$(4x - 2i)(4x + 2i) = 0$

Simplify the number using the imaginary unit i.

B

17. $\sqrt{-360}$

a. $6\sqrt{-10}$
b. $6i\sqrt{10}$
c. $i\sqrt{360}$
d. $-6\sqrt{10}$

-1, $360 = 36 \cdot 10$, $36 = 6 \cdot 6$, $6 = 2 \cdot 3$, $10 = 2 \cdot 5$

$\rightarrow 2 \cdot 3 \cdot i\sqrt{5 \cdot 2}$
$\rightarrow 6i\sqrt{10}$

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What is the solution of each equation?

B 18. $3x^2 = 21$

$\frac{3x^2}{3} = \frac{21}{3}$

$x^2 = 7$

$\sqrt{\ } \quad \pm\sqrt{\ }$

$x = \pm\sqrt{7}$

a. $\sqrt{7}$

b. $\sqrt{7}, -\sqrt{7}$

c. $\frac{-\sqrt{21}}{3}, \frac{\sqrt{21}}{3}$

d. $-\sqrt{7}, \sqrt{21}$

What value completes the square for the expression?

C 19. $x^2 - 18x$

$\left(\frac{-18}{2}\right)^2 = (-9)^2 = 81$

a. 9

b. –9

c. 81

d. –81

Use the Quadratic Formula to solve the equation.

B 20. $-x^2 + 6x - 5 = 0$

$\frac{-(6) \pm \sqrt{(6)^2 - 4(-1)(-5)}}{2(-1)}$

$\frac{-6 \pm \sqrt{36 - 20}}{-2} = \frac{-6 \pm \sqrt{16}}{-2} = \frac{-6 \pm 4}{-2} = \frac{-2}{-2}, \frac{-10}{-2}$

$= 1, 5$

a. –5, –1

b. 1, 5

c. –5, 11

d. 2, 10

C 21. $2x^2 + x - 4 = 0$

a. $-\frac{1}{2} \pm \frac{\sqrt{33}}{4}$

b. $-4 \pm \frac{\sqrt{66}}{4}$

c. $-\frac{1}{4} \pm \frac{\sqrt{33}}{4}$

d. $-\frac{1}{2} \pm \frac{\sqrt{33}}{2}$

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

$\frac{-1 \pm \sqrt{1 + 32}}{4} = \frac{-1 \pm \sqrt{33}}{4}$

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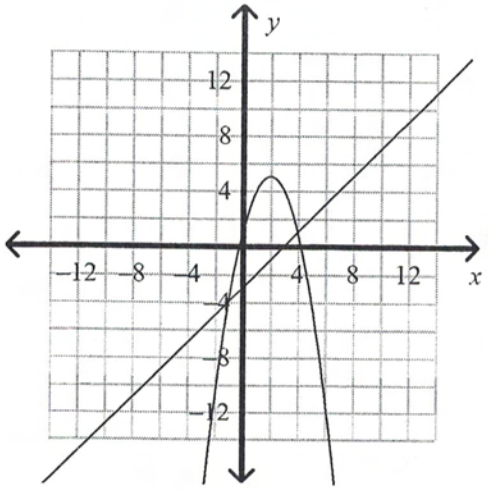
Use graphing to find the solutions to the system of equations.

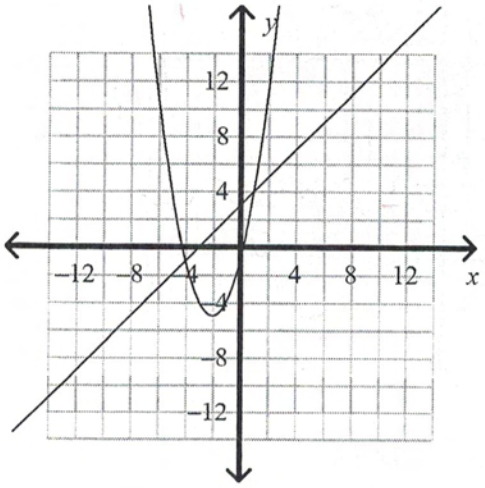
b 22. $\begin{cases} y = -x^2 - 4x + 1 \\ y = -x - 3 \end{cases}$ GC

a.



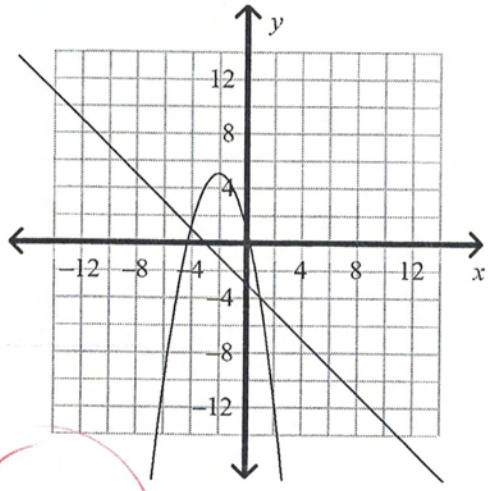
(4, 1)
(−1, −4)

c.



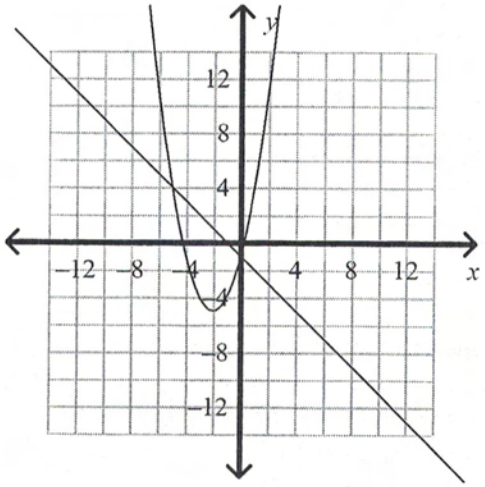
(1, 4)
(−4, −1)

b.



(−4, 1)
(1, −4)

d.



(1, 4)
(−4, −1)

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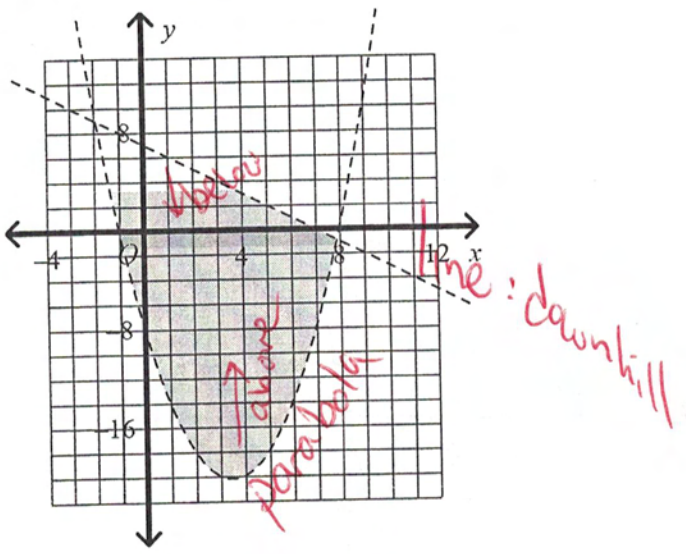
C 23. Which system of inequalities is graphed below?



a. $\begin{cases} y > x^2 + 7x - 8 \\ y < x + 7 \end{cases}$

b. $\begin{cases} y < x^2 + 7x - 8 \\ y > x + 7 \end{cases}$

c. $\begin{cases} y > x^2 - 7x - 8 \\ y < -x + 7 \end{cases}$

d. $\begin{cases} y < x^2 - 7x - 8 \\ y > -x + 7 \end{cases}$

C 24. What is the solution of $5x^2 + 6x - 23 = -6x - 9$? Use a linear-quadratic system and the intersection feature of a graphing calculator to solve.

a. $x \approx -4.00$ and $x \approx 1.60$
b. $x \approx -1.67$ and $x \approx 1.67$
c. $x \approx -3.26$ and $x \approx 0.86$
d. $x \approx -0.86$ and $x \approx 3.26$

GC → GRAPH → GSLV → ISCT → ▷