

1. Simplify each of the following expressions.

(a) $\sqrt{125} - 3\sqrt{80} + \sqrt{45} = -4\sqrt{5}$

(b) $(\sqrt{7} - 2)^2 = 11 - 4\sqrt{7}$

(c) $(\sqrt{3} - 1)^3 = 6\sqrt{3} - 10$

2. Rationalize the denominator in each of the following expressions.

(a) $\frac{3}{\sqrt{5}} = \frac{3\sqrt{5}}{5}$

(b) $\frac{1}{\sqrt{10} - 3} = \sqrt{10} + 3$

(c) $\frac{2}{\sqrt{7} + 1} = \frac{\sqrt{7} - 1}{3}$

3. Find the exact value of $x^2 - 4x + 6$ if $x = 2 - \sqrt{3}$. 5

4. Factor $13x + 2x^2 - 24$ by completing the square. $(x + 8)(2x - 3)$

5. Solve each of the following equations. Make sure to check your solution(s).

(a) $2x^3 = 20x^2 + 1750x$ 35, 0, -25

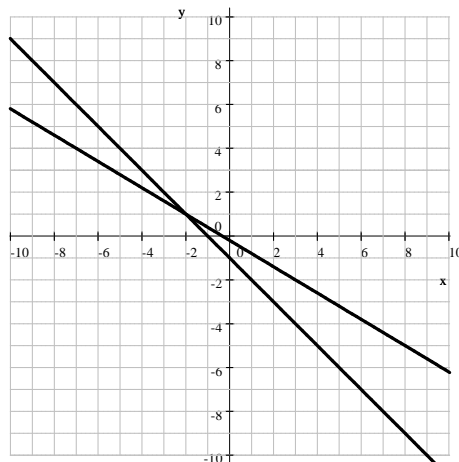
(b) $\frac{3x + 17}{2} = x - 1 + \frac{x + 19}{2}$ identity, all numbers are solution

(c) $|3 - 2x| + 2 = 5$ 0, 3

(d) $\frac{2}{3}(x - 7) = \frac{4}{5}(x + 1)$ -41

(e) $7x^2 + (x + 3)(2x - 1) = (3x + 1)^2$ -4

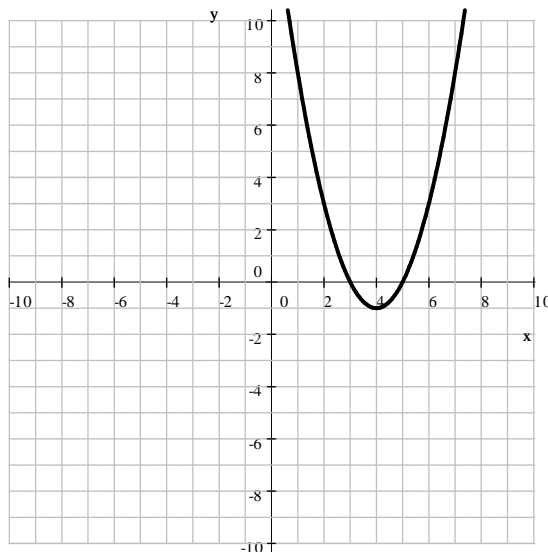
6. Graph the straight lines $3x + 5y = -1$ and $y = -x - 1$ in the same coordinate system. Use your graph to find the coordinates of the point where the lines intersect. $(-2, 1)$



7. Graph the parabola $y = -8x + x^2 + 15$. Clearly label the coordinates of five points on the parabola, including vertex and intercepts.

y -intercept: $(0, 15)$ vertex: $(4, -1)$ x -intercepts: $(3, 0)$ and $(5, 0)$

other points on the graph: $(1, 8)$, $(2, 3)$, $(6, 3)$, and $(7, 8)$



8. There is an animal farm where chickens and cows live. All together, there are 53 heads and 174 legs. How many chickens, how many cows? **19 chickens and 34 cows**
9. One side of a rectangle is 4 in shorter than 3 times the other side. Find the sides of the rectangle if its perimeter is 48 in. **7 in by 17 in**
10. One side of a rectangle is 4 in shorter than 3 times the other side. Find the sides of the rectangle if its area is 319 in^2 . **11 in by 29 in**
11. The population of a town has decreased from 80000 to 68000. What percent of a decrease does this represent? **15% decrease**
12. We have invested \$ 15 000 into two accounts. One account earns 6% interest every year, the other account earns 7% every year. How much did we invest into each account if the combined interest was \$ 1008 after the first year? **\$ 4200 at 6% and \$10800 at 7%**
13. The hypotenuse of a right triangle is 68 cm. The difference between the other two sides is 28 cm. Find the sides of the triangle. **32 cm and 60 cm**
14. Find the distance between $(3, 8)$ and $(8, -4)$. **13 units**