

Find all real or imaginary solutions in #s 1 – 5..

1. (5 pts) $3x + 2 = -x - 5$

2. (5 pts) $\frac{2}{3}x - \frac{1}{4} = \frac{5}{6}$

3. (5 pts) $3x^2 = 5$

4. (5 pts) $3x^2 + 6x + 13 = 0$

5. (10 pts) Compute the discriminant for each of the following equations and tell me what it tells you about the solutions of the equations, *without having to solve them*, i.e., don't solve.

a. $x^2 - 6x - 5 = 0$

b. $x^2 + 6x + 17 = 0$

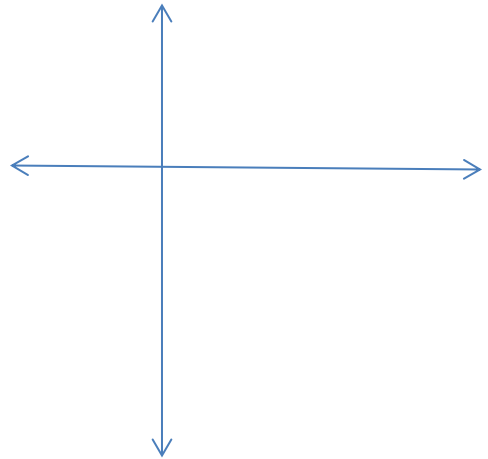


6. (10 pts) Solve $x^2 + 6x - 17 = 0$ by completing the square.

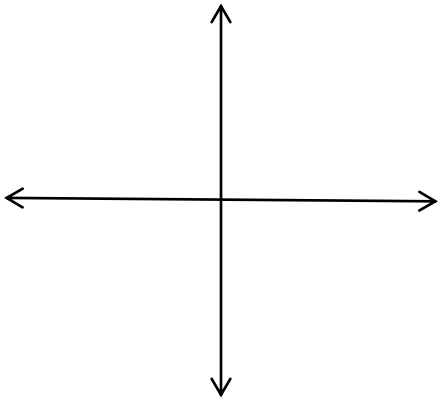
7. (5 pts) Find an equation of the line through $(-3,1)$ and $(2,7)$. Point-slope is preferred, but not required.

8. (5 pts) Find an equation of the line thru $(3,5)$ that is perpendicular to the line $y = \frac{4}{7}x - 11$.

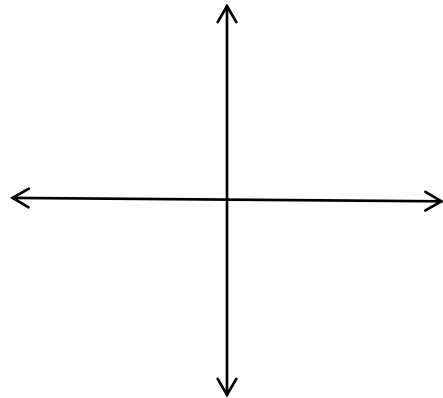
9. (5 pts) Sketch the graph of the line $y = \frac{4}{7}x - 11$.



10. (5 pts) Sketch the graph of the line $x = 512$



11. (5 pts) Sketch the graph of the line $y = 11$



Solve the inequalities.

12. (5 pts) $-3x - 5 \geq 4$

13. (5 pts) $|2x - 3| \geq 7$

14. (5 pts) $|2x - 3| < 7$

15. (5 pts) $|2x - 3| < -7$

16. (5 pts) $|2x - 3| \geq -7$

17. (5 pts) Suppose population growth in a small town is linear (a straight line). Also suppose the population was 10,000 in 1998 and 12,000 in 2011. Model the town's population (in thousands) as a function of time (in years after 1998). Then use your model to predict the population in 2014.

18. (5 pts) How many liters of 15% alcohol must be added to 90 liters of 47% alcohol to obtain a mixture of 35% alcohol?

BONUS Page. Work *one* of the following. Expect one or all three types on the next test.

BONUS (10 pts) Suppose I take 5 hours to do a job that Kelli can do in 4 hours. Then on top of that, I start work one hour late! How many hours does Kelli end up spending on the job, until it's finished? Hint: If you take the average of our times, you're doing it wrong.



BONUS (10 pts) Re-write the function $f(x) = x^2 + 6x + 17$ in the form

$f(x) = a(x - h)^2 + k$. State the vertex of this parabola.

BONUS (10 pts) Re-write the function $g(x) = 3x^2 + 6x - 13$ in the form $g(x) = a(x - h)^2 + k$. State the vertex of this parabola.