INTERSECTIONS OF LINES, PARABOLAS, HYPERBOLAS AND CIRCLES.

Find the intersections of the following pairs of graphs using algebraic methods and do careful sketch graphs of each situation.

You should also check the intersections with your graphics calculators.

1. $y = x^2$

   $y = x + 6$

2. $y = x^2 - 3x - 4$
   $= (x - 4)(x + 1)$

   $y = x - 7$

3. $y = x^2 - 4$
   $= (x + 2)(x - 2)$

   $y = 2x - 5$

4. $y = x^2$

   $y = x - 4$

5. $y = x^2 + 2x - 8$
   $= (x + 4)(x - 2)$

   $y = 2x - 4$

6.* If $y = 2x + p$ is a tangent to $y = x^2 + x - 2$ find the value of p.

7. $y = \frac{1}{x}$

   $y = 2 - x$

8. $y = \frac{1}{x}$

   $y = 2x - 1$

9. $y = \frac{6}{x}$

   $y = 7 - x$

10. $y = -\frac{4}{x}$

    $y = x - 5$

11.* If $y = b - x$ is a tangent to $y = \frac{4}{x}$ find b.

12.* If $y = mx + 8$ is a tangent to $y = \frac{2}{x}$ find the value of m.

13. $x^2 + y^2 = 25$

    $y = x - 1$

14. $x^2 + y^2 = 25$

    $y = 2x - 2$

15. $y^2 + x^2 = 5$

    $y = x + 1$

16. $y^2 + x^2 = 13$

    $y = x + 1$

17. $x^2 + y^2 = 10$

    $y = 3x$

18. $x^2 + y^2 = 8$

    $y = x + 4$

19* If $y = x + p$ is a tangent to $x^2 + y^2 = 2$ find the possible values of c.

20.** $x^2 + y^2 = 2$

    $y = \frac{1}{x}$