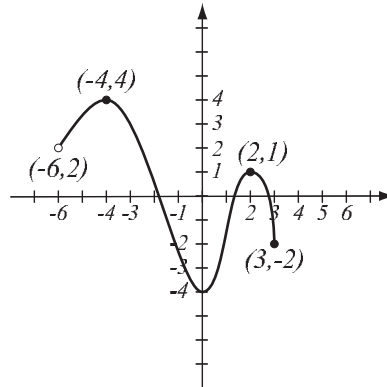


1. (8pts) Use the graph of the function f at right to answer the following questions.

- Find: $f(2) =$ $f(-6) =$
- What is the domain of f ?
- What is the range of f ?
- What are the solutions of the equation $f(x) = 3$?



2. (10pts) Use your calculator to accurately sketch the graph of $y = -x^3 + 8x + 12$.

- Draw the graph on paper and indicate units on the axes.
- Find all the x - and y -intercepts (accuracy: 6 decimal points).

3. (5pts) Write the equation of the line whose x -intercept is 3, and y -intercept is -5.

4. (10pts) Find the equation of the line (in form $y = mx + b$) that is perpendicular to the line $x + 4y = -8$ and passes through $(2, -1)$. Draw both lines.

5. (8pts) Draw the triangle with vertices $A = (0, 0)$, $B = (3, 2)$ and $C = (7, -4)$ in the coordinate plane. Use the Pythagorean theorem to determine if the triangle is a right triangle.

6. (9pts) Let $f(x) = x^2 + 4x - \frac{1}{\sqrt{x+1}}$. Find the following (simplify where appropriate).

$$f(3) =$$

$$f(-6) =$$

$$f(\sqrt{u}) =$$

$$f(t - 3) =$$

7. (9pts) Find the domains of the functions below and write them using interval notation.

$$f(x) = \frac{x - 3}{2x - 5}$$

$$g(x) = \frac{\sqrt{5 - 3x}}{x + 8}$$

8. (5pts) Solve and write the solution in interval notation.

$$-2 \leq 5 - 2x < 4$$

9. (10pts) The diameter of a circle has endpoints $(-3, 2)$ and $(1, 0)$.

a) Find the equation of the circle.

b) Draw the circle in the coordinate plane.

10. (12pts) Ellen plans to invest \$12,000: part at 3.5% simple interest, and the rest at 4.5% simple interest. What is the most she can invest at 3.5% to guarantee receiving \$500 in interest in a year? Solve as an inequality.

11. (14pts) Amy and Mitch bicycle along the same road. It takes Mitch 1 hour to travel the road. Amy leaves 12 minutes after Mitch, but gets to the end of the road at the same time as Mitch because she travels 2 mph faster than him.

a) What are the speeds of the cyclists?

b) How long is the road?

Bonus (10pts) Let $A = (1, 5)$ be a point in the plane. Find a point B on the x -axis so that the line through A and B is parallel to the line $y = 3x - 1$.