1) For each polynomial: state the number of terms, the degree of the polynomial, and the leading term (leading coefficient).

a) $5x^2 - x^3 + 2 - 7x$

b) $2n + 3n^3 + n^4 - 5n^2 - 3$

2) Combine 'like' terms: $3xy + 2x^2y - 5x + 6xy - xy^2 + 10x - 9xy^2 + 4x^2y$

3) Add or subtract the polynomials.

a) $(3a^2 - 5 + 2a) - (7a - a^2 - 9) - (-3a + 12 - 4a)$

b) Add:
$$\begin{array}{r} 3n^3 + 7n^2 - 4n + 1 \\ 2n^3 - 4n^2 \qquad - 9 \\ \underline{-3n^3 + 9n^2 - n + 13} \end{array}$$

c) $\left(\frac{3}{4}a + \frac{4}{5}\right) - \left(\frac{2}{3}a - \frac{3}{2}\right) - \left(\frac{5}{6} - a\right)$

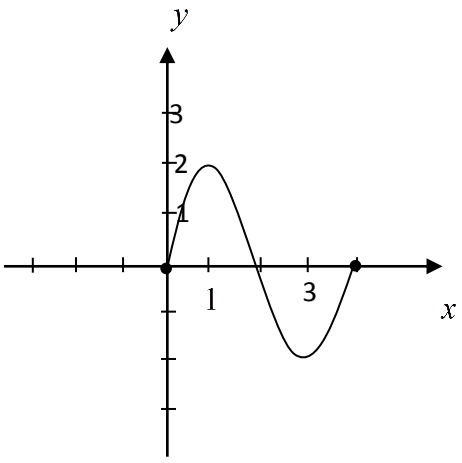
4) Simplify: $3(2r + 9) - 4(8 - 3r) + 5(3r) - 18(r - 1)$

5) Identify which of the following (*a* – *f*) are functions. Identify the domain and range for each.

a)

x	-3	-1	0	1	2	3	3	5	9
y	2	2	1	8	-6	0	5	4	10

b)



c) $y = |3x + 6|$

d) $b = \sqrt{a - 5}$

e) $y = \dfrac{x}{x - 2}$

f) $x = y^2$

6) Given the three functions below, find the following function values.

$$f(x)=x^2-x+1 \qquad g(x)=\sqrt{2x+3} \qquad h(x)=\frac{2x+5}{3x-1}$$

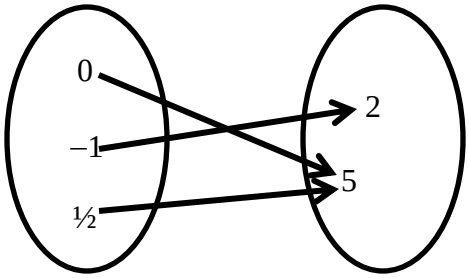
a) $f(3)$ *b*) $g(-1)$ *c*) $h(3a-2)$

d) $f(-15)$ *e*) $g(3)$ *f*) $h\left(\frac{1}{3}\right)$

7) Given $F(t)=-2t+\pi$, find the following.

a) $F(3\pi)$ *b*) $F(h-4\pi)$

8) At the right is a function *g*.



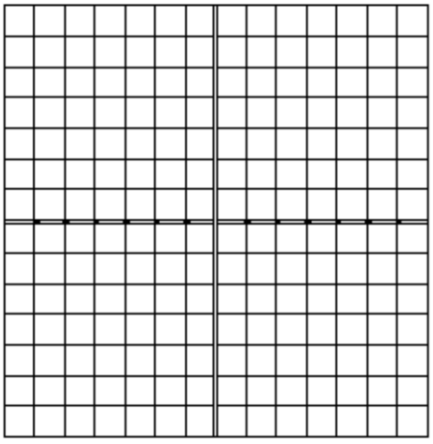
Find the following information.

a) $g(-1)$ *b*) $g(x)=2,$ what is x?

c) $g\left(\frac{1}{2}\right)$

9) Sketch the following linear functions.
Use a scale of 1 unit per hash mark on both axes.

a) $f(x)=\frac{1}{2}x+4$ *b*) $g(x)=-x-1$



10) The function $H(x)=2.75x+71.48$ can be used to predict the height, in centimeters, of a woman whose humerus (the bone from the elbow to the shoulder) is *x* centimeters long. Predict the height of a woman whose humerus is a length of 34 cm.

Find each product.

11) $3y^2(2y^4-4y^3+9y^2-7y-6)$

12) $(4a-9)(3a+4)$

13) $5x(6x-5)(3x-2)$

14) $(4n+3)(3n^2-n+2)$

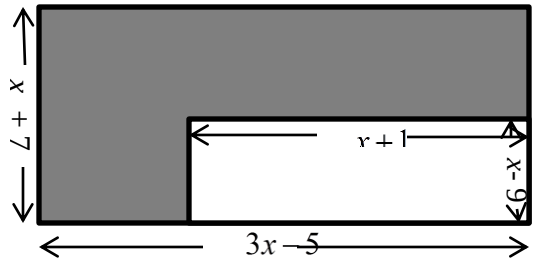
15) Multiply:

$$\begin{array}{r} 4x^2-2x+3 \\ \underline{\qquad 6x-5} \end{array}$$

16) Find each product. *a*) $(6x-\frac{1}{2})(6x+\frac{1}{2})$ *b*) $(12x-5)^2$

17) Find this product: $(4x+3)(2x-1)(x+4)$

18) Find the area shaded in gray below (as a polynomial).



19) A rectangular box has length $2x-4$, width $x+6$, and height $x+11$. Find the volume of the box (as a polynomial) if the length and width are both increased by 3 units and the height is decreased by 4 units.

Solve each equation.

20) $5(2x-3)-4(x+9)=-(x+12)+9$

21) $\frac{4}{5}x-2=3+\frac{2x-9}{2}$

22) $\frac{21}{16}-\frac{48}{2x-4}=\frac{9}{8}$

23) $\frac{2}{x+5}+\frac{1}{x-5}=\frac{16}{x^2-25}$

24) $\frac{3}{4}-\frac{1}{x}=\frac{7}{8x}$

25) $\frac{4}{t^2+t-12}=\frac{1}{t+4}-\frac{2}{t-3}$

26) $2x-5x+9=5-3(x-4)$

Write an equation for each applied problem. Solve the equation and state the answer to the problem.

27) A mother wants to invest \$6000 for her daughter's future wedding. She invests part of the money in a bank certificate of deposit which earns 4% and the remainder of the money in a bond that earns 7%. In the first year, both investments yielded a total of \$360 interest. How much money was invested in the bond?

28) A pharmacist wishes to mix a solution that is 4% Minoxidil. He has on hand 80 mL of a 3% Minoxidil solution and will add an unknown amount of a 6% Minoxidil solution to obtain the desired 4% solution. How much of the 6% Minoxidil solution should he add?

29) A truck enters an interstate highway driving 60 miles per hour. A car enters at the same location 13 minutes later and drives 74 miles per hour following the truck's route. How long has the car been on the interstate highway before it will pass the truck?

30) Dr. Smith can ride his bike to his office and averages 7.5 miles per hour. If he drives his car, he averages 30 miles per hour. By car, the trip is 12 minutes less time than biking. How far is Dr. Smith's office from his home?

31) Jean can wax her car in 2 hours time. When Helen helps her, they can wax the car in ½ hour. How long would it take Helen alone to wax Jean's car?