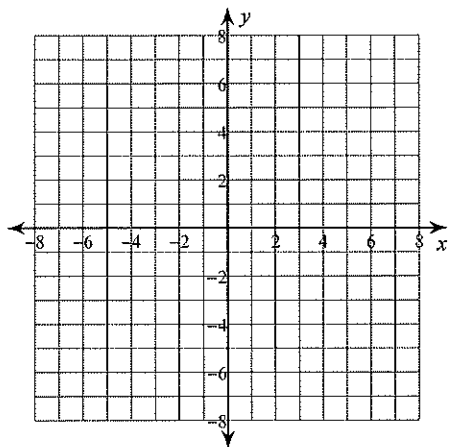


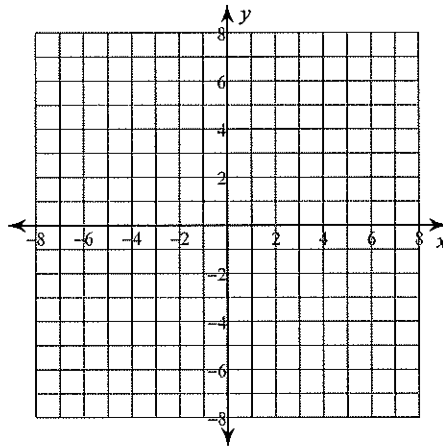
Summer Packet for Precalculus

Identify the vertex and x-intercepts of each. Then sketch the graph.

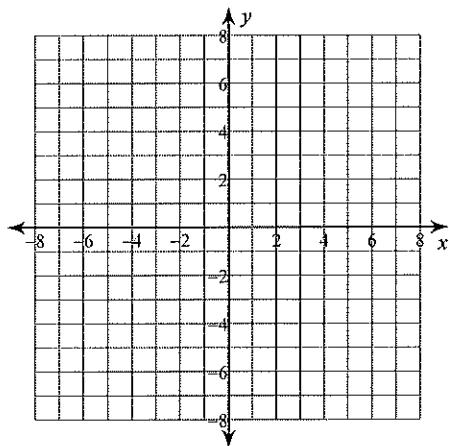
1) $y = x^2 + 5x$



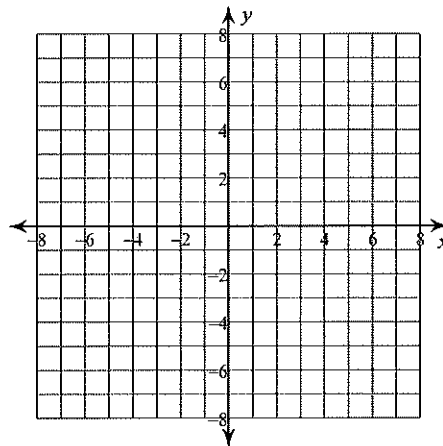
2) $y = -\frac{1}{4}x^2 - \frac{3}{4}x - \frac{1}{2}$



3) $y = -x^2 + 2x$



4) $y = x^2 + 9x + 14$



Perform the indicated operation.

5) $g(x) = 2x$
 $h(x) = x^2 + 3$
Find $(2g - h)(x)$

6) $f(t) = -3t - 5$
 $g(t) = t + 4$
Find $(3f - 3g)(t)$

7) $h(x) = 4x + 2$
 $g(x) = -2x^2 + 4x$
Find $(h \circ g)(x)$

8) $h(x) = -x^3 + 3x$
 $g(x) = 3x - 4$
Find $(h \circ g)(x)$

9) $h(x) = 3x - 5$
 $g(x) = 2x + 2$
Find $(h \circ g)(-4)$

10) $f(n) = -3n^2 - 1$
 $g(n) = 3n - 3$
Find $(f \circ g)(-1)$

Solve each equation. Remember to check for extraneous solutions.

11) $x^2 - 8x + 32 = 0$

12) $x^2 - 8x + 20 = 0$

13) $x^2 - 8x + 25 = 0$

14) $x^2 - 3x - 10 = 0$

$$15) x^2 + 2x + 5 = 0$$

$$16) x^2 - 4x + 3 = 0$$

$$17) x^2 - 25 = 0$$

$$18) x^2 + 6x + 25 = 0$$

$$19) \frac{r-3}{r} - \frac{1}{2r} = \frac{2}{r}$$

$$20) \frac{1}{x} + \frac{x-5}{x} = \frac{2}{x}$$

$$21) \frac{n^2 + 7n + 10}{4n^3} = \frac{1}{4n^2} + \frac{1}{4n}$$

$$22) \frac{1}{6a^2} = \frac{3a^2 + 8a - 3}{3a^3} + \frac{1}{2a}$$

$$23) \frac{6}{m-2} + \frac{1}{m^2-2m} = \frac{3}{m}$$

$$24) \frac{2}{m^2-4m-5} + \frac{1}{m-5} = \frac{1}{m^2-4m-5}$$

$$25) 6x - 18 = \frac{x^2 - x - 20}{x - 6} - \frac{4}{x - 6}$$

$$26) \frac{x + 2}{x^2 + 6x} = \frac{3x - 3}{x^3 + 6x^2} + \frac{x^2 - 5x - 6}{x^3 + 6x^2}$$

$$27) 4e^{2x} = 51$$

$$28) e^{r-2} - 7 = 73$$

$$29) 9e^{-3x} = 88$$

$$30) e^{9n} + 9 = 32$$

$$31) \ln 4x^2 - \ln 4 = \ln 64$$

$$32) \ln(x^2 - 5) + \ln 2 = 5$$

$$33) \ln 9 + \ln -5x = 4$$

$$34) \ln 2x^2 - \ln 8 = 2$$

Find the common difference, the term named in the problem, and the explicit formula.

35) 23, 3, -17, -37, ...

Find a_{34}

36) 35, 42, 49, 56, ...

Find a_{29}

37) 1, 11, 21, 31, ...

Find a_{21}

38) 37, 39, 41, 43, ...

Find a_{37}

Evaluate each arithmetic series described.

39) $a_1 = 18$, $a_n = 118$, $n = 11$

40) $a_1 = 13$, $a_n = 49$, $n = 7$

41) $\sum_{m=1}^{45} (4m + 1)$

42) $\sum_{n=1}^{11} (15 - 7n)$

Find the common ratio, the 8th term, and the explicit formula.

43) 1, 5, 25, 125, ...

44) 3, 9, 27, 81, ...

45) 1, -4, 16, -64, ...

46) 4, 20, 100, 500, ...

Evaluate each geometric series described.

47) $a_1 = -4$, $a_n = -62500$, $r = 5$

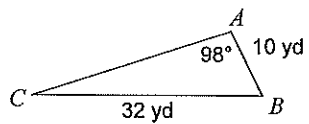
48) $a_1 = 4$, $a_n = -78732$, $r = -3$

49) $\sum_{k=1}^8 (-5)^{k-1}$

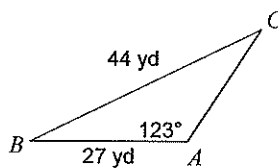
50) $\sum_{m=1}^{10} 3^{m-1}$

Solve each triangle. Round your answers to the nearest tenth.

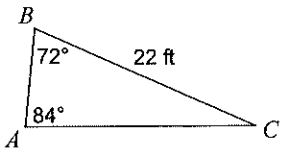
51)



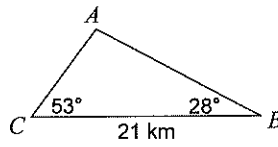
52)



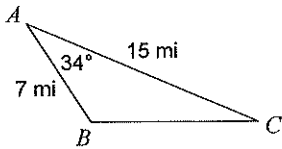
53)



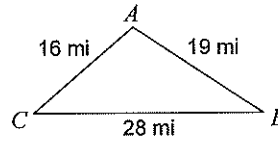
54)



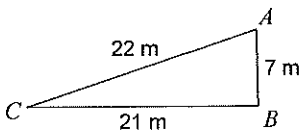
55)



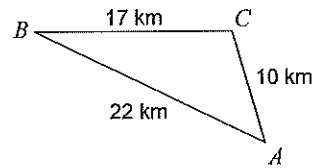
56)



57)



58)



Simplify. Write "undefined" for expressions that are undefined.

$$59) \begin{bmatrix} 1 \\ -5 \\ 4 \end{bmatrix} - \begin{bmatrix} -1 \\ -6 \\ -6 \end{bmatrix}$$

$$60) -4 \left(\begin{bmatrix} 1 & -6 & -5 \\ 1 & -1 & -4 \end{bmatrix} + \begin{bmatrix} 3 & -5 & 6 \\ -4 & 6 & 6 \end{bmatrix} \right)$$

$$61) \begin{bmatrix} -4 & 6 & -5 & 0 \end{bmatrix} - \begin{bmatrix} 2 & 2 & 2 & -6 \end{bmatrix}$$

$$62) 2 \left(\begin{bmatrix} -4 & -4 \\ -5 & 2 \end{bmatrix} - \begin{bmatrix} 0 & 4 \\ 5 & -2 \end{bmatrix} \right)$$

$$63) \begin{bmatrix} 3 & -1 & -3 \\ 0 & 4 & 5 \end{bmatrix} + \begin{bmatrix} 3 & 3 & 4 \\ 6 & -4 & 4 \end{bmatrix}$$

$$64) -2 \left(\begin{bmatrix} -1 & -6 & 6 \end{bmatrix} + \begin{bmatrix} -2 & -1 & -3 \end{bmatrix} \right)$$

$$65) \begin{bmatrix} -6 & 0 & 0 \\ -6 & -2 & 3 \end{bmatrix} \cdot \begin{bmatrix} 5 & -2 \\ -6 & 6 \\ -5 & 4 \end{bmatrix}$$

$$66) \begin{bmatrix} 0 & -6 \\ 3 & -3 \end{bmatrix} \cdot \begin{bmatrix} -3 & -1 & 6 \\ 5 & 6 & -1 \end{bmatrix}$$

$$67) \begin{bmatrix} 2 & 6 \\ -4 & -5 \\ -6 & -1 \end{bmatrix} \cdot \begin{bmatrix} 2 & 4 \\ 6 & 3 \end{bmatrix}$$

$$68) \begin{bmatrix} -2 & 5 & 2 \end{bmatrix} \cdot \begin{bmatrix} 0 & -1 \\ 5 & -1 \\ 1 & -2 \end{bmatrix}$$

$$69) \begin{bmatrix} 2 & 1 \end{bmatrix} \cdot \begin{bmatrix} -6 & -4 \\ -1 & 6 \end{bmatrix}$$

$$70) \begin{bmatrix} 3 & -3 \\ 6 & 5 \\ 5 & 5 \end{bmatrix} \cdot \begin{bmatrix} -6 \\ 6 \end{bmatrix}$$

Evaluate each determinant.

$$71) \begin{vmatrix} -4 & -5 \\ -4 & 2 \end{vmatrix}$$

$$72) \begin{vmatrix} 3 & -1 \\ -5 & -1 \end{vmatrix}$$

$$73) \begin{vmatrix} 4 & 3 \\ 1 & -4 \end{vmatrix}$$

$$74) \begin{vmatrix} -2 & 1 \\ -3 & 1 \end{vmatrix}$$

$$75) \begin{vmatrix} -4 & -2 \\ 4 & -4 \end{vmatrix}$$

$$76) \begin{vmatrix} 1 & 3 \\ -2 & 2 \end{vmatrix}$$

$$77) \begin{vmatrix} 4 & 5 & 5 \\ 2 & 5 & 2 \\ 4 & -3 & -1 \end{vmatrix}$$

$$78) \begin{vmatrix} -5 & -2 & 2 \\ 5 & -5 & 4 \\ 5 & 1 & 0 \end{vmatrix}$$

$$79) \begin{vmatrix} -1 & 4 & 2 \\ -2 & -2 & -2 \\ -4 & 2 & -3 \end{vmatrix}$$

$$80) \begin{vmatrix} 3 & 2 & 4 \\ -3 & -5 & -3 \\ 5 & -5 & 3 \end{vmatrix}$$