

Summer Packet for Precalculus

Perform the indicated operation.

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

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

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

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

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

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

Solve each equation. Remember to check for extraneous solutions.

7) $x^2 + 2x - 25 = 0$

8) $x^2 - 4 = 0$

9) $\frac{1}{6v} = \frac{v+5}{2v^2} - \frac{1}{3v^2}$

10) $\frac{1}{x^2} - \frac{1}{4} = \frac{x+2}{4x^2}$

$$11) \frac{1}{n^2 - 2n} - \frac{5}{n - 2} = \frac{n + 6}{n^2 - 2n}$$

$$12) \frac{x + 1}{x} - \frac{1}{x^2 - 5x} = \frac{5x - 15}{x}$$

$$13) e^{k+9} - 7 = 75$$

$$14) -2e^{-4a} = -65$$

$$15) \ln 3x^2 - \ln 3 = 4$$

$$16) \ln 5 - \ln (x + 2) = \ln 8$$

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

$$17) -26, -21, -16, -11, \dots$$

Find a_{26}

$$18) -13, -33, -53, -73, \dots$$

Find a_{25}

Evaluate each arithmetic series described.

$$19) a_1 = -31, a_n = -131, n = 11$$

$$20) \sum_{k=1}^{15} (6k - 16)$$

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

$$21) 2, 8, 32, 128, \dots$$

$$22) 4, 16, 64, 256, \dots$$

Evaluate each geometric series described.

23) $a_1 = 1$, $a_n = 390625$, $r = 5$

24) $\sum_{k=1}^7 -3 \cdot (-6)^{k-1}$

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

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

26) $\begin{bmatrix} -4 & 2 \\ 1 & -1 \\ -4 & 1 \end{bmatrix} \cdot \begin{bmatrix} 2 & -2 \\ 4 & 3 \end{bmatrix}$

Evaluate each determinant.

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

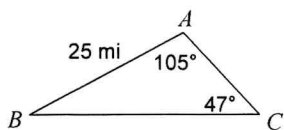
28) $\begin{vmatrix} -1 & 3 \\ 0 & -3 \end{vmatrix}$

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

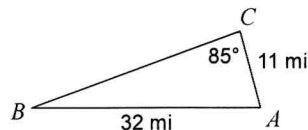
30) $\begin{vmatrix} -1 & 5 & 5 \\ -2 & -2 & 3 \\ -1 & 0 & 1 \end{vmatrix}$

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

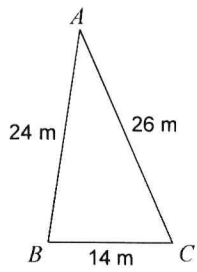
31)



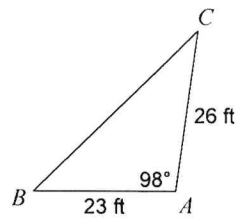
32)



33)



34)



Use identities to find the value of each expression.

35) Find $\sec \theta$ and $\tan \theta$

$$\text{if } \cos \theta = \frac{3}{4} \text{ and } \sin \theta < 0.$$

36) Find $\sec \theta$ and $\cot \theta$

$$\text{if } \tan \theta = \frac{4}{7} \text{ and } \sec \theta > 0.$$

Find the exact value of each.

37) $\cos -\frac{5\pi}{12}$

38) $\sin \frac{7\pi}{12}$

39) $\tan \theta = \frac{15}{8}$ where $2\pi \leq \theta < \frac{5\pi}{2}$

Find $\sin 2\theta$

40) $\sin \theta = \frac{15}{17}$ where $\frac{\pi}{2} \leq \theta < \pi$

Find $\tan \frac{\theta}{2}$