

Solve

- $5 + 2 \sin x - 7 = 0$
- $4 \cos^2 x - 3 = 0$
- $\sin x \cos x - 5 \cos x = 0$
- $3 \cos x = \cos x - 1$
- $\sin^2 x = 1 - \cos x$
- $\tan^3 x = -\tan^2 x$

Simplify

- $\sec^2 x \tan^2 x + \sec^2 x$
- $(\csc x + 1)(\csc x - 1)$
- $\csc x \tan^2 x - \sec^2 x \csc x$
- $\frac{\tan^2 x + 1}{1 - \sin^2 x}$
- $\frac{1 + \tan^2 x}{\csc x \sec x}$
- $\frac{1 - \sin^4 x}{1 + \sin^2 x}$
- $\frac{\sec x}{\tan x}$
- $\frac{1 - \cot^4 x}{1 - \cot^2 x}$
- $\cos\left(\frac{\pi}{2} - x\right) \sec x$
- $\cot\left(\frac{\pi}{2} - x\right) \cos x$

Prove the following are identities:

- $(\sin x + \cos x)^2 + (\sin x - \cos x)^2 = 2$
- $\tan x (\csc x - \sin x) = \cos x$
- $\frac{\cos^4 x - \sin^4 x}{\cos 2x} = 1$
- $\csc 2x = \frac{1}{2} \csc x \sec x$
- $\sec^2\left(\frac{\pi}{2} - x\right) - 1 = \cot^2 x$
- $\csc^4 x - 2\csc^2 x + 1 = \cot^4 x$
- $\frac{\sec^2 x}{\tan x} = \sec x \csc x$
- $\sec x - \sin x \tan x = \cos x$
- $\frac{\csc^2 x}{\csc^2 x - 1} = \sec^2 x$
- $\frac{1 + \tan^2 x}{\cos^2 x} = \sec^4 x$

Solve the triangle

- $B = 38^\circ; C = 21^\circ; b = 24$
- $C = 61^\circ; c = 30; b = 25$
- $a = 20; b = 10; A = 31^\circ$
- $a = 12; b = 14; c = 20$
- $B = 72^\circ; a = 78; c = 16$
- $A = 70^\circ; B = 12^\circ; b = 21$

Find the area of the triangle –

- $B = 42^\circ; a = 7; c = 3$
- $C = 75^\circ; a = 1.5; b = 2$
- $A = 113^\circ; b = 18; c = 24$

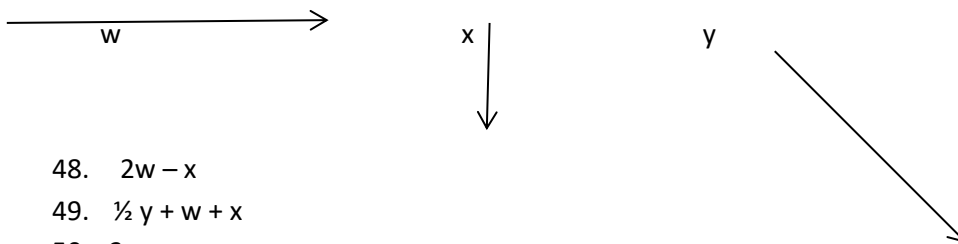
Find the missing information

36. Given $a = 4$, $b = 5$, and $c = 2.5$, find angle B
37. Triangle has sides $a = 15$, $b = 20$, and $A = 29^\circ$, find the rest!
38. Triangle has sides $a = 15$, $b = 28$, and $A = 44^\circ$, find the rest!
39. Triangle ABC where points A and B are opposite points of a crater. Point C is 50 m from point A. If A is 112° and C is 42° . What is the length between A and B (the width of the crater)?
40. A sail on a boat is in the shape of an isosceles triangle and the top vertex angle is 38° . The two sides come down at 20 ft. each. What are the base angle measurements and what is the length of the base itself?
41. From the top of a 200-ft lighthouse, the angle of depression to a ship on the ocean is 23° . How far is the ship from the base of the lighthouse?
42. A 96-ft tree casts a shadow that is 120 ft long. What is the angle of elevation?
43. A man is lying on the beach, flying a kite. He holds the end of the kite string at ground level and estimates the angle of elevation to the kite to be 50° . If the string is 450 ft long, how high is the kite above the ground?
44. A builder wishes to construct a ramp 24 ft long that rises to a height of 5 feet above the ground. Find the angle of elevation of the ramp.
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Given the right triangle ABC (C is the right angle), find all remaining sides/angles-

45. $A = 29^\circ$, $c = 11$
46. $b = 3$, $c = 7$
47. $B = 13^\circ$, $c = 6$
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Given these vectors, graph the following resultants



48. $2w - x$
49. $\frac{1}{2}y + w + x$
50. $-3x - w$

Graph and label the following 3-d points (you only need one grid...)

51. $(-2, 3, -6)$ 52. $(3, -4, 5)$ 53. $(4, -5, -3)$

Find the magnitude for the vectors –

54. $\langle 4, 5 \rangle$

55. $\langle -2, 5, -4 \rangle$

56. $\langle -10, 4, 7 \rangle$

Given the points (initial followed by terminal), write the component form of the vector

57. (2, -5) (9, -11)

59. (-3, -5, -8) (11, -12, -14)

58. (4, 3, 5) (7, -1, 8)

Determine if the following vectors are orthogonal.

60. $\langle 4, 6 \rangle$ and $\langle 7, 9 \rangle$

61. $\langle 9, -9, 6 \rangle$ and $\langle 6, 4, -3 \rangle$

Find the direction angle of each vector

62. $\langle 4, 7 \rangle$

64. $\langle -8, 0 \rangle$

63. $\langle -6, -2 \rangle$

65. $\langle 5, -1 \rangle$

Find the angle between these vectors

66. $\langle 2, -3 \rangle$ and $\langle -4, 3 \rangle$.

67. $\langle -4, -1, -3 \rangle$ and $\langle 7, 3, 4 \rangle$

Solve

68. A ship is moving due west at 12 mph. The water is moving at 3 mph due north. What is the resultant of the two and what direction is the ship actually going?

Find all solutions over the interval of $[0, 2\pi)$

69. $\sec x = 1 + \tan x$

70. $\cos 2x + \sin x = 1$

71. $\sin \frac{\theta}{2} + \cos \theta = 1$

72. $3 \tan^2 \theta - \sqrt{3} \tan \theta = 0$

Write the first 5 terms of the defined sequence

73. $a_n = \frac{6n+5}{n}$

75. $a_n = 2048 \left(\frac{1}{2}\right)^{n-1}$

74. $a_n = 3(2)^{n-1}$

76. $a_n = \frac{a_{n-1} - 3}{4}; a_1 = 144$

Write an explicit rule for each sequence

77. $-13, -7, -1, 5, 11, 17, \dots$

78. $0.75, 3, 12, 48, 192, \dots$

79. $-\frac{1}{64}, \frac{1}{8}, -1, 8, -64, \dots$

80. An arithmetic series with 1st term 199 and 58th term 940

81. A geometric series with 1st term 14 and 5th term 70.875

82. An arithmetic series with 23rd term 125 and 111th term -403

83. A geometric series with 11th term 4 and 22nd term 8192

Write a recursive rule for each

84. $3, 10, 17, 24, 31, 38, \dots$

85. $3, 6, 12, 24, 48, \dots$

Evaluate each series for the number of given terms

86. $2 + 6 + 18 + 54 + \dots$; $n = 6$

87. $-1 + (-2) + (-4) + (-8) + \dots$; $n = 7$

88. $35 + 29 + 23 + 17 + \dots$; $n = 15$

89. $27 + 37 + 47 + 57 + \dots$; $n = 16$

Evaluate each series

90. $\sum_{n=1}^9 3(4)^{n-1}$

91. $\sum_{k=1}^{15} (6 - 7k)$

92. $\sum_{i=1}^{\infty} 8(-.5)^{i-1}$

93. $\sum_{x=1}^{40} (15 - 9x)$

94. $\sum_{d=1}^9 (-5)^{d-1}$

95. $\sum_{n=4}^{13} \left(-\frac{31}{15} + \frac{2}{3}n \right)$

96. $\sum_{j=1}^{\infty} 8(-2)^{j-1}$

97. $\sum_{m=13}^{52} (2.3m + 4.5)$