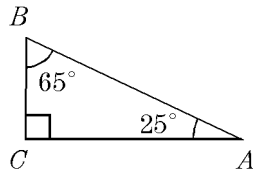Name _____   Date _____

1. In $\triangle ABC$, $m\angle C = 90°$, $AC = 3$, $BC = 4$, and $AB = 5$. Find $\cos \angle A$.
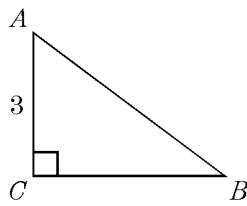
2. In $\triangle ABC$, $m\angle C = 90°$, $AC = 3$, $BC = 4$, and $AB = 5$. Find $\cot \angle B$.

3. Find $\sin 32°$.
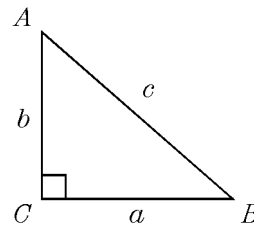
4. Find $\tan 45°$.

5. Find $\sin \angle A$.

6. Find $\cos \angle A$.

7. If $\sin \theta = \frac{5}{7}$, find θ to the nearest degree.

8. If $\tan \angle K = \frac{7}{10}$, find $m\angle K$ to the nearest degree.

9. If $\sin \angle B = \frac{3}{4}$, find AB.

10. If $a = 7$ and $b = 9$, find $m\angle A$ to the nearest tenth of a degree.

11. Find $\sin 30°$.

12. Find $\sin 60°$.

13. Find $\sin 45°$.

14. Find $\cos 30°$.

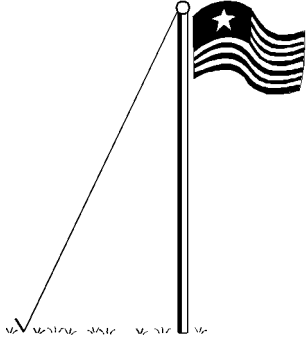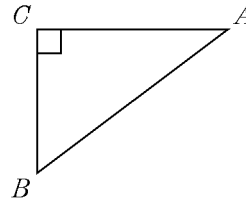15. If $AC = 1$, find BC.

16. If $AB = 2$, find BC.

17. When an 11 foot 11 inches tall tree casts a 10 inch long shadow, what is the angle of elevation of the sun?

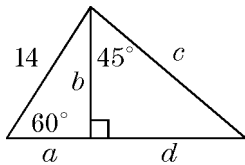18. If $\cos \angle F = \frac{4}{5}$, find $\tan \angle F$.

19. A wire 32 feet long is attached to the top of a flagpole 23 feet long. Approximately what is the measure of the angle the wire makes with the ground? Round your answer to the nearest tenth of a degree or nearest ten minutes.
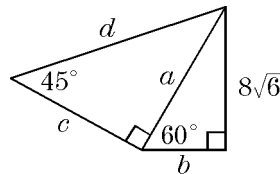

20. Solve the right triangle if $\angle A = 41°$ and $b = 12.5$ centimeters. Give lengths to 3 significant figures and angles to the nearest tenth of a degree.

21. Find the exact value of each labelled part in the figure.

22. Find the exact value of each labelled part in the figure.

23. $b = 45$, $\alpha = 56°$, $\beta = 72°$

24. $b = 27$, $a = 54$, $\beta = 30°$

25. $a = 9$, $b = 12$, $\alpha = 47°$

26. $a = 6.9$, $c = 11.4$, $\beta = 141°$

27. $a = 4$, $b = 5$, $\gamma = 30°$

28. Two fire towers, at points A and B, are on a lakeshore 40 kilometers apart. Each has visual contact with a ranger at point C. If $m\angle CAB = 20°30'$ and $m\angle CBA = 110°$, how far is the ranger from point A?

29. A rectangular patio is surrounded on three sides by a fence (the remaining side is up against the house). If the area of the patio is $38\,\text{m}^2$, and the total length of fence is $18\,\text{m}$, what is the length and width of the patio?

30. The equation of the axis of symmetry of a parabola is $x + 2 = 0$ and one point on the graph is $\mathbf{P}(5, 3)$. Find another point on the graph.

31. A rectangular swimming pool is 12 meters long and 8 meters wide. It is surrounded by a cement walkway of uniform width. The area of the walkway is twice the area of the pool. How wide is the walkway?

Simplify.

32. $\sqrt[3]{8a^3}$

33. $-\sqrt[5]{\dfrac{1024a^5b^{10}}{16,807}}$

34. $\sqrt[3]{\dfrac{-125x^5y^4z^7}{8x^2y^{10}z^4}}$

35. $\sqrt[3]{\sqrt[3]{512m^9n^{18}}}$

36. $-\dfrac{5}{2}\sqrt{40}\cdot 3\sqrt{60}$

37. $(-\dfrac{2\sqrt{15}}{3})(2\sqrt{30})(-\sqrt{45})$

38. $\sqrt{8a^5}(-\sqrt{2a^3})$

39. $\sqrt{33c^2d}\cdot\sqrt{66d^5c^5}$

40. $2cd\sqrt{5c^3d}\cdot\sqrt{55cd^2}$

41. $\sqrt{3a+6}\cdot\sqrt{3a-6}$

42. $\dfrac{8\sqrt{11}}{3\sqrt{5}}$

43. $\sqrt{\dfrac{1}{5}}\cdot\sqrt{\dfrac{2}{3}}$

44. $\dfrac{\sqrt[3]{8}}{\sqrt[5]{-32}}$

45. $\dfrac{5n}{\sqrt{15n}}$

46. $\dfrac{3e^4f^7}{\sqrt{12e^2f^3}}$

47. $\dfrac{\sqrt{x-y}}{\sqrt{x^2y-xy^2}}$

48. $-\sqrt{121}+\sqrt{144}-\sqrt{49}$

49. $2\sqrt{80}-3\sqrt{45}+3\sqrt{245}$

50. $\sqrt{49e^2}+\sqrt{64e^3}$

51. $-3cd\sqrt{75c}+2\sqrt{12c^3d^2}$

52. $-3y\sqrt[5]{64y^6}-2\sqrt[5]{486y^{11}}$

Factor.

53. $162-45x+3x^2$

54. $35cb^2-14cb-21c$

55. $4m^2-324$

56. m^4-98m^2+2401

57. $2(k-4)-k(k-4)+k^2(k-4)$

58. $27-64y^3$

59. $216z^3-125a^3$

60. $64-w^6$

Solve.

61. $0=p^2+5p+2$

62. $a^2+7a=15$

63. $2x-3x^2=-2x-12$

Simplify (assume variable expressions are positive).

64. $(x^3-x^2-17x+12)\div(4+x)$

65. $(7x^4-5x^3+35x^2-46x+15)\div(7x-5)$

Solve by completing the square.

66. $m^2 + 6m = -7$

67. $3z^2 + 12z + 15 = 0$

68. Factor $x^{6y} - y^{9x}$ completely.

69. Factor $(x^2 + 2x)^2 - 11(x^2 + 2x) + 24$ completely.

70. Simplify: $\dfrac{\sqrt{x} - \dfrac{1}{\sqrt{x}}}{\dfrac{1 - \sqrt{x}}{\sqrt{x}}} =$

Find the slope.

71. $\left(\frac{1}{2}, -3\right)$ $\left(4\frac{1}{2}, 0\right)$

72. $(2x, y)$ $(7x, 2y)$

73. $\left(\frac{3}{4}, \frac{1}{3}\right)$ $\left(-\frac{1}{4}, \frac{1}{6}\right)$

74. $(a + b, b)$ $(a - b, -b)$

75. $(p - 1, -8p)$ $(9p - 1, 7p)$

76. contains $(2, -2)$ and $(-6, 1)$

77. A segment has endpoints at $(k, k + 4)$ and $(8 - k, k + 2)$. What is the midpoint?

78. What are the x- and y-intercepts of the line: $-5x + 16y - 6 = 0$?

79. Given $K(0, 5)$, $M(-1, -2)$ and $N(7, 10)$. Write the equation of the line which passes through K and the midpoint of **MN.**

80. Given $A(0, -3)$, $B(3, 8)$ and $C(-2, 5)$. Write the equation of the line which passes through B and is parallel to $\overleftrightarrow{AC}$.

81. Given $E(-7, 4)$ and $F(1, -8)$. Write the equation of the line which is perpendicular to $\overleftrightarrow{EF}$ and contains the midpoint of **EF.**

Solve.

82. $3x - y = 0$
$5x + 5 = 0$

83. $y = -\frac{1}{3}x$
$x + 6y + 9 = 0$

84. $x - y + 4 = 0$
$-2x + y - 8 = 0$

85. $\dfrac{y + 4}{x - 4} = \dfrac{7}{3}$
$\dfrac{y - 4}{x} = -\dfrac{1}{7}$

86. $y = x^2 + 2$
$y = -3x + 2$

87. $-2x + 5y - z = -4$
$4x - 5y + z = 9$
$2x + 10y + 3z = 12$

88. $a - 2b + c + d - e = 4$
$a - c - d = 1$
$b + c + e = -2$
$2a - c + 2d = 12$
$a + 2b + d + e = 4$

89. $18 + 6c \geq 4c - 5$

90. $3 + \frac{1}{4}(7 - 3n) \geq \frac{1}{3}(2 - 3n) + 4$

91. A triangle has vertices $(-5, -2)$, $(2, -2)$, and $(-5, 3)$. Find the perimeter of the triangle.

92. For what value(s) of k are the points $(k+3, -6)$, $(5, k-7)$, and $(2,2)$ collinear?

93. A tower $52\,\text{m}$ high can be seen from a point **P** on a level with the foot of the tower. If the angle of elevation to the top of the tower is $38°$, then how far is **P** from the base of the tower? Answer to 1 decimal place.

94. If $\sin\theta = \frac{2}{3}$ then what is the $\tan\theta$?

Math 9 Enriched   Final Exam Review   Mr. Young   2015-06-03

Answer List

1. $\frac{3}{5}$

2. $\frac{4}{3}$

3. 0.5299

4. 1.000

5. 0.4226

6. 0.9063

7. $46°$

8. $35°$

9. 4

10. $37.9°$

11. $\frac{1}{2}$

12. $\frac{\sqrt{3}}{2}$

13. $\frac{\sqrt{2}}{2}$

14. $\frac{\sqrt{3}}{2}$

15. $\sqrt{3}$

16. $\sqrt{3}$

17. $\approx 86°$

18. $\frac{3}{4}$

19. $46.0°$

20. $\angle\mathbf{B} = 49.0°$, $a \approx 10.9\,\text{cm}$, $c \approx 16.6\,\text{cm}$

21. $a = 7$, $b = 7\sqrt{3}$, $c = 7\sqrt{6}$, $d = 7\sqrt{3}$

22. $a = 16\sqrt{2}$, $b = 8\sqrt{2}$, $r = 16\sqrt{2}$, $s = 32$

23. $\gamma = 52°$, $c = 37.3$, $a = 39.2$

24. $c = 27\sqrt{3}$, $\alpha = 90°$, $\gamma = 60°$

25. $c = 10.18$, $\beta = 77.2°$, $\gamma = 55.8°$ or $c = 6.19$, $\beta = 102.8°$, $\gamma = 30.2°$

26. $b = 17.3$, $\alpha = 14.5°$, $\gamma = 24.5°$

27. $\alpha = 52.5°$, $\beta = 97.5°$, $c = 2.5$

28. $49.43\,\text{km}$

29. about $11.2 \times 3.4\,\text{m}$

30. $(-9, 3)$

31. $\approx 3.5\,\text{m}$

32. $2a$

33. $\frac{-4ab^2}{7}$

34. $\frac{-5xz}{2y^2}$

35. $2mn^2$

36. $-150\sqrt{6}$

37. $60\sqrt{10}$

38. $-4a^4$

39. $33d^3c^3\sqrt{2c}$

40. $10c^3d^2\sqrt{11d}$

41. $3\sqrt{a^2 - 4}$

42. $\frac{8\sqrt{55}}{15}$

43. $\frac{\sqrt{30}}{15}$

44. -1

45. $\frac{\sqrt{15n}}{3}$

46. $\frac{e^3f^5\sqrt{3f}}{2}$

47. $\frac{\sqrt{xy}}{xy}$

48. -6

49. $20\sqrt{5}$

50. $7e + 8e\sqrt{e}$

51. $-11cd\sqrt{3c}$

52. $-12y^2\sqrt[5]{2y}$

53. $3(6 - x)(9 - x)$

54. $7c(b - 1)(5b + 3)$

55. $4(m + 9)(m - 9)$

56. $(m + 7)^2(m - 7)^2$

57. $(k - 4)(2 - k + k^2)$

58. $(3 - 4y)(9 + 12y + 16y^2)$

59. $(6z - 5a)(36z^2 + 30az + 25a^2)$

60. $(4 - w^2)(16 + 4w^2 + w^4)$

61. $\frac{-5 \pm \sqrt{17}}{2}$

62. $\frac{-7 \pm \sqrt{109}}{2}$

63. $\frac{2 \pm 2\sqrt{10}}{3}$

64. $x^2 - 5x + 3$

65. $x^3 + 5x - 3$

66. $-3 \pm \sqrt{2}$

67. $\varnothing$

68. $(x^{2y} - y^{3x})(x^{4y} + x^{2y}y^{3x} + y^{6x})$

69. $(x - 1)(x - 2)(x + 3)(x + 4)$

70. $-(1 + \sqrt{x})$

71. $\frac{3}{4}$

72. $\frac{y}{5x}$

73. $\left(\frac{1}{4}, \frac{1}{4}\right)$

74. $(a, 0)$

75. $17p$

76. $y = -\frac{3}{8}x - \frac{5}{4}$

77. $(4, k + 3)$

78. $-\frac{6}{5}$ and $\frac{3}{8}$

79. $y = -\frac{1}{3}x + 5$

80. $y = -4x + 20$

81. $y = \frac{2}{3}x$

82. $(-1, -3)$

83. $(9, -3)$

84. $(-4, 0)$

85. $(7, 3)$

86. $(0, 2)$ and $(-3, 11)$

87. $\left(\frac{5}{2}, \frac{2}{5}, 1\right)$

88. $(2, -1, -2, 3, 1)$

89. $c \geq -\frac{23}{2}$

90. $n \geq -\frac{1}{3}$

91. $12 + \sqrt{74}$

92. $3, 5$

93. $66.6\,\text{m}$

94. $\pm\frac{2}{\sqrt{5}}$

Catalog List

1. TRI MB 2	2. TRI MB 12	3. TRI MC 1
4. TRI MC 21	5. TRI MC 61	6. TRI MC 62
7. TRI ME 15	8. TRI ME 21	9. TRI MF 1
10. TRI MG 25	11. TRI MH 1	12. TRI MH 2
13. TRI MH 3	14. TRI MH 4	15. TRI MI 1
16. TRI MI 34	17. TRI ML 15	18. TRI MK 7
19. TRI ML 3	20. TRI MJ 4	21. TRI OH 53
22. TRI OH 56	23. TRI QF 1	24. TRI QF 17
25. TRI QF 45	26. TRI QG 15	27. TRI QG 33
28. TRI QK 1	29. ALG NH 33	30. CM1 ME 55
31. ALG NH 43	32. TRI BB 41	33. TRI BB 55
34. TRI BB 59	35. TRI BB 104	36. TRI BC 39
37. TRI BC 52	38. TRI BC 97	39. TRI BC 119
40. TRI BC 128	41. TRI BC 135	42. TRI BD 31
43. TRI BD 65	44. TRI BD 69	45. TRI BD 105
46. TRI BD 132	47. TRI BD 160	48. TRI BE 1
49. TRI BE 20	50. TRI BE 73	51. TRI BE 80
52. TRI BE 99	53. TRI AD 3	54. TRI AD 12
55. TRI AD 20	56. TRI AD 32	57. TRI AD 52
58. TRI AD 87	59. TRI AD 91	60. TRI AD 104
61. TRI DB 79	62. TRI DB 99	63. TRI DB 103
64. TRI GA 27	65. TRI GA 103	66. ALG NC 31
67. ALG NC 62	68. CM1 AB 41	69. CM1 AC 73
70. CM1 BC 55	71. ALG PA 55	72. ALG PA 105
73. ALG PB 39	74. ALG PB 55	75. ALG PC 64
76. ALG PF 125	77. ALG PG 87	78. ALG PG 132
79. ALG PG 212	80. ALG PH 46	81. ALG PH 56
82. ALG QA 19	83. ALG QA 59	84. ALG QA 147
85. ALG QC 44	86. ALG QC 90	87. ALG QD 23
88. TRI FD 112	89. ALG OB 26	90. ALG OB 92
91. TRI EA 116	92. TRI EB 171	93. CM1 HE 85
94. CM1 GB 65		