

Math 9 Enriched
Final Exam Review

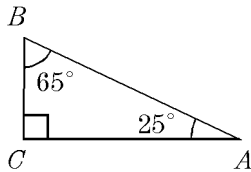
Name _____

Date _____

1. In $\triangle ABC$, $m\angle C = 90^\circ$, $AC = 3$, $BC = 4$, and $AB = 5$. Find $\cos \angle A$.

3. Find $\sin 32^\circ$.

5. Find $\sin \angle A$.



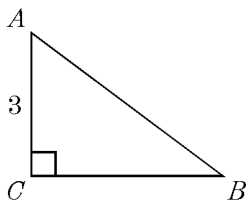
2. In $\triangle ABC$, $m\angle C = 90^\circ$, $AC = 3$, $BC = 4$, and $AB = 5$. Find $\cot \angle B$.

4. Find $\tan 45^\circ$.

6. Find $\cos \angle A$.

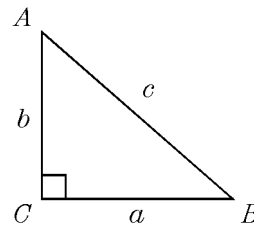
7. If $\sin \theta = \frac{5}{7}$, find θ to the nearest degree.

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



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

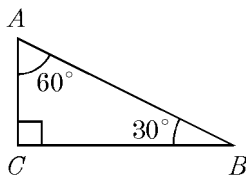
10. If $a = 7$ and $b = 9$, find $m\angle A$ to the nearest tenth of a degree.



11. Find $\sin 30^\circ$.

13. Find $\sin 45^\circ$.

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



12. Find $\sin 60^\circ$.

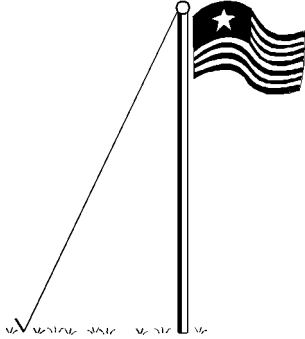
14. Find $\cos 30^\circ$.

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

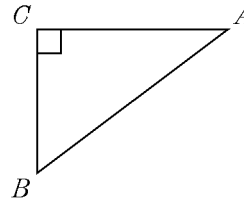
17. When an 11 foot 11 inches tall tree casts a 10 inch long shadow, what is the angle of elevation of the sun?

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

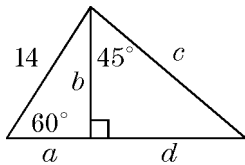
19. A wire 32 feet long is attached to the top of a flagpole 23 feet long. Approximately what is the measure of the angle the wire makes with the ground? Round your answer to the nearest tenth of a degree or nearest ten minutes.



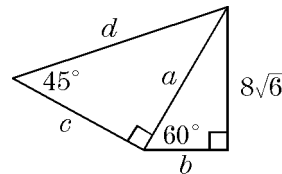
20. Solve the right triangle if $\angle A = 41^\circ$ and $b = 12.5$ centimeters. Give lengths to 3 significant figures and angles to the nearest tenth of a degree.



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. $b = 45$, $\alpha = 56^\circ$, $\beta = 72^\circ$

25. $a = 9$, $b = 12$, $\alpha = 47^\circ$

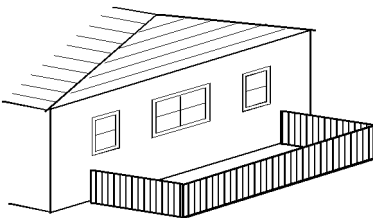
27. $a = 4$, $b = 5$, $\gamma = 30^\circ$

24. $b = 27$, $a = 54$, $\beta = 30^\circ$

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

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 $m\angle CAB = 20^\circ 30'$ and $m\angle CBA = 110^\circ$, 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 m^2 , and the total length of fence is 18m, 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.

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

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

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

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

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

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

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

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

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

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

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

Factor.

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

$$55. 4m^2 - 324$$

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

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

Solve.

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

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

Simplify (assume variable expressions are positive).

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

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

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

$$37. \left(-\frac{2\sqrt{15}}{3}\right)(2\sqrt{30})(-\sqrt{45})$$

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

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

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

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

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

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

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

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

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

$$58. 27 - 64y^3$$

$$60. 64 - w^6$$

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

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

Solve by completing the square.

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

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

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

Find the slope.

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

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

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

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

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 \overline{MN} .

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

Solve.

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

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

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

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

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

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

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

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

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

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

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

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} .

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

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

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

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

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 m high can be seen from a point \mathbf{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 \mathbf{P} from the base of the tower? Answer to 1 decimal place.
94. If $\sin \theta = \frac{2}{3}$ then what is the $\tan \theta$?

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. $\approx 86^\circ$ | 18. $\frac{3}{4}$ |
| 19. 46.0° | 20. $\angle B = 49.0^\circ$, $a \approx 10.9$ cm,
$c \approx 16.6$ 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. $\gamma = 52^\circ$, $c = 37.3$, $a = 39.2$ | 24. $c = 27\sqrt{3}$, $\alpha = 90^\circ$, $\gamma = 60^\circ$ |
| 25. $c = 10.18$, $\beta = 77.2^\circ$, $\gamma = 55.8^\circ$
or $c = 6.19$, $\beta = 102.8^\circ$,
$\gamma = 30.2^\circ$ | 26. $b = 17.3$, $\alpha = 14.5^\circ$, $\gamma = 24.5^\circ$ | 27. $\alpha = 52.5^\circ$, $\beta = 97.5^\circ$, $c = 2.5$ |
| 28. 49.43 km | 29. about 11.2×3.4 m | 30. $(-9, 3)$ |
| 31. ≈ 3.5 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. $-12y^2\sqrt[3]{2y}$ | 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. \emptyset | 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. $(\frac{1}{4}, \frac{1}{4})$ | 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. $(\frac{5}{2}, \frac{2}{5}, 1)$ |
| 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 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