Table of Symbols

Symbol		Page
$\sqrt{a}$	square root of a	2
$-a$	opposite of a	2
$\ldots$	and so on	3
$\cdot$	multiplication, times	6
(x, y)	ordered pair	8
$\overleftrightarrow{AB}$	line AB	10
$\overline{AB}$	segment AB	11
$\overrightarrow{AB}$	ray AB	11
AB	the length of AB	17
$\lvert x \rvert$	absolute value of x	17
x_1	x sub 1	19
$=$	is equal to	19
$\cong$	is congruent to	19
$\angle ABC$	angle ABC	26
$m\angle A$	measure of angle A	26
$^\circ$	degree(s)	26
π	pi; irrational number ≈ 3.14	51
$\approx$	is approximately equal to	52
$\neq$	not equal to	72
$\perp$	is perpendicular to	79
$\rightarrow$	implies	87
$\leftrightarrow$	if and only if	87
$\sim p$	negation of statement p	88
$\parallel$	is parallel to	129
m	slope	165

Symbol		Page
$\triangle ABC$	triangle ABC	194
$\triangle$	triangles	230
$\measuredangle$	angles	270
$<$	is less than	295
$>$	is greater than	296
$\square ABCD$	parallelogram $ABCD$	330
$\ncong$	not congruent to	353
A'	A prime	396
A''	A double prime	411
$\overrightarrow{AB}$	vector AB	423
$\langle a, b \rangle$	component form of a vector	423
$\frac{a}{b}, a:b$	ratio of a to b	457
$\sim$	is similar to	473
$\stackrel{?}{=}$	is this statement true?	543
$\sin$	sine	558
$\cos$	cosine	558
$\tan$	tangent	558
$\sin^{-1}$	inverse sine	567
$\cos^{-1}$	inverse cosine	567
$\tan^{-1}$	inverse tangent	567
$\lvert \overrightarrow{AB} \rvert$	magnitude of a vector	573
$\odot P$	circle P	595
$m\overset{\frown}{AB}$	measure of minor arc AB	603
$m\overset{\frown}{ABC}$	measure of major arc ABC	603
n-gon	polygon with n sides	661

Formulas

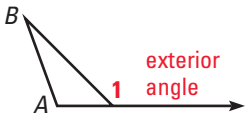
Angles

Sum of the measures of the interior angles of a triangle: 180°

Sum of the measures of the interior angles of a convex n-gon: $(n - 2) \cdot 180°$

Measure of each interior angle of a regular n-gon:
$\frac{1}{n}(n - 2) \cdot 180°$

Exterior angle of a triangle:
$m\angle 1 = m\angle A + m\angle B$



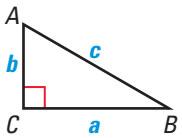
Sum of the measure of the exterior angles of a convex polygon: 360°

Measure of each exterior angle of a regular n-gon:
$\frac{1}{n} \cdot 360°$

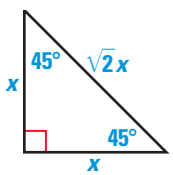
Right Triangles

Pythagorean Theorem:
$a^2 + b^2 = c^2$

Trigonometric ratios:
$\sin A = \frac{a}{c}$ $\cos A = \frac{b}{c}$ $\tan A = \frac{a}{b}$

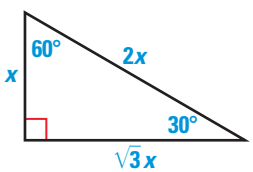


45°-45°-90° triangle

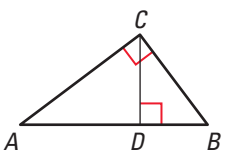


Ratio of sides
1: 1: $\sqrt{2}$

30°-60°-90° triangle



Ratio of sides
1: $\sqrt{3}$: 2



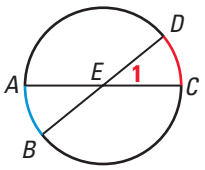
$\triangle ABC \sim \triangle ACD \sim \triangle CBD$

$\frac{BD}{CD} = \frac{CD}{AD}, \frac{AB}{CB} = \frac{CB}{DB}, \frac{AB}{AC} = \frac{AC}{AD}$

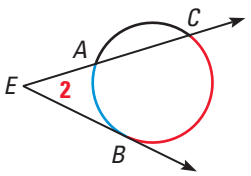
$CD = \sqrt{AD \cdot DB}$

Circles

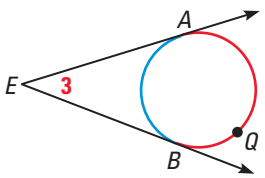
Angle and segments formed by two chords:
$m\angle 1 = \frac{1}{2}(m\overset{\frown}{CD} + m\overset{\frown}{AB})$
$EA \cdot EC = EB \cdot ED$



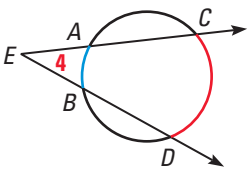
Angle and segments formed by a tangent and a secant:
$m\angle 2 = \frac{1}{2}(m\overset{\frown}{BC} - m\overset{\frown}{AB})$
$EA \cdot EC = (EB)^2$



Angle and segments formed by two tangents:
$m\angle 3 = \frac{1}{2}(m\overset{\frown}{AQB} - m\overset{\frown}{AB})$
$EA = EB$



Angle and segments formed by two secants:
$m\angle 4 = \frac{1}{2}(m\overset{\frown}{CD} - m\overset{\frown}{AB})$
$EA \cdot EC = EB \cdot ED$



Coordinate Geometry

Given: Points $A(x_1, y_1)$ and $B(x_2, y_2)$
$AB = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

Midpoint of $\overline{AB} = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$

Slope of $\overleftrightarrow{AB} = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1}$

Slope-intercept form of a linear equation with slope m and y-intercept b: $y = mx + b$

Standard equation of a circle with center (h, k) and radius r: $(x - h)^2 + (y - k)^2 = r^2$

Vectors

$\vec{u} = \langle a_1, b_1 \rangle, \vec{v} = \langle a_2, b_2 \rangle$

$\vec{u} + \vec{v} = \langle a_1 + a_2, b_1 + b_2 \rangle$

Perimeter

P = perimeter, C = circumference,
s = side, ℓ = length, w = width,
$a, b, c,$ = lengths of the sides of a triangle,
r = radius

Square: $P = 4s$

Rectangle: $P = 2\ell + 2w$

Triangle: $P = a + b + c$

Circle: $C = 2\pi r$

Arc length of $\overset{\frown}{AB} = \frac{m\overset{\frown}{AB}}{360^\circ} \cdot 2\pi r$

Area

A = area, s = side, b = base, h = height,
ℓ = length, w = width, d = diagonal,
a = apothem, P = perimeter, r = radius

Square: $A = s^2$

Rectangle: $A = \ell w$

Parallelogram: $A = bh$

Triangle: $A = \frac{1}{2}bh$

Trapezoid: $A = \frac{1}{2}h(b_1 + b_2)$

Quadrilateral with ⊥ diagonals: $A = \frac{1}{2}d_1d_2$

Equilateral triangle: $A = \frac{1}{4}\sqrt{3}s^2$

Regular polygon: $A = \frac{1}{2}aP$

Circle: $A = \pi r^2$

Area of a sector: $A = \frac{m\overset{\frown}{AB}}{360^\circ} \cdot \pi r^2$

Surface Area

B = area of the base, P = perimeter,
h = height, r = radius, ℓ = slant height

Right prism: $S = 2B + Ph$

Right cylinder: $S = 2\pi r^2 + 2\pi rh$

Regular pyramid: $S = B + \frac{1}{2}P\ell$

Right cone: $S = \pi r^2 + \pi r\ell$

Sphere: $S = 4\pi r^2$

Volume

V = volume, B = area of a base,
h = height, r = radius, s = side

Cube: $V = s^3$

Pyramid: $V = \frac{1}{3}Bh$

Cone: $V = \frac{1}{3}\pi r^2h$

Cylinder: $V = \pi r^2h$

Prism: $V = Bh$

Sphere: $V = \frac{4}{3}\pi r^3$

Miscellaneous

Geometric mean of a and b: $\sqrt{a \cdot b}$

Euler's Theorem for Polyhedra, F = faces,
V = vertices, E = edges: $F + V = E + 2$

Given similar solids with corresponding sides of lengths a and b

Ratio of areas = $a^2 : b^2$

Ratio of volumes = $a^3 : b^3$

Table of Squares and Square Roots

No.	Square	Sq. Root
1	1	1.000
2	4	1.414
3	9	1.732
4	16	2.000
5	25	2.236
6	36	2.449
7	49	2.646
8	64	2.828
9	81	3.000
10	100	3.162
11	121	3.317
12	144	3.464
13	169	3.606
14	196	3.742
15	225	3.873
16	256	4.000
17	289	4.123
18	324	4.243
19	361	4.359
20	400	4.472
21	441	4.583
22	484	4.690
23	529	4.796
24	576	4.899
25	625	5.000
26	676	5.099
27	729	5.196
28	784	5.292
29	841	5.385
30	900	5.477
31	961	5.568
32	1,024	5.657
33	1,089	5.745
34	1,156	5.831
35	1,225	5.916
36	1,296	6.000
37	1,369	6.083
38	1,444	6.164
39	1,521	6.245
40	1,600	6.325
41	1,681	6.403
42	1,764	6.481
43	1,849	6.557
44	1,936	6.633
45	2,025	6.708
46	2,116	6.782
47	2,209	6.856
48	2,304	6.928
49	2,401	7.000
50	2,500	7.071

No.	Square	Sq. Root
51	2,601	7.141
52	2,704	7.211
53	2,809	7.280
54	2,916	7.348
55	3,025	7.416
56	3,136	7.483
57	3,249	7.550
58	3,364	7.616
59	3,481	7.681
60	3,600	7.746
61	3,721	7.810
62	3,844	7.874
63	3,969	7.937
64	4,096	8.000
65	4,225	8.062
66	4,356	8.124
67	4,489	8.185
68	4,624	8.246
69	4,761	8.307
70	4,900	8.367
71	5,041	8.426
72	5,184	8.485
73	5,329	8.544
74	5,476	8.602
75	5,625	8.660
76	5,776	8.718
77	5,929	8.775
78	6,084	8.832
79	6,241	8.888
80	6,400	8.944
81	6,561	9.000
82	6,724	9.055
83	6,889	9.110
84	7,056	9.165
85	7,225	9.220
86	7,396	9.274
87	7,569	9.327
88	7,744	9.381
89	7,921	9.434
90	8,100	9.487
91	8,281	9.539
92	8,464	9.592
93	8,649	9.644
94	8,836	9.695
95	9,025	9.747
96	9,216	9.798
97	9,409	9.849
98	9,604	9.899
99	9,801	9.950
100	10,000	10.000

No.	Square	Sq. Root
101	10,201	10.050
102	10,404	10.100
103	10,609	10.149
104	10,816	10.198
105	11,025	10.247
106	11,236	10.296
107	11,449	10.344
108	11,664	10.392
109	11,881	10.440
110	12,100	10.488
111	12,321	10.536
112	12,544	10.583
113	12,769	10.630
114	12,996	10.677
115	13,225	10.724
116	13,456	10.770
117	13,689	10.817
118	13,924	10.863
119	14,161	10.909
120	14,400	10.954
121	14,641	11.000
122	14,884	11.045
123	15,129	11.091
124	15,376	11.136
125	15,625	11.180
126	15,876	11.225
127	16,129	11.269
128	16,384	11.314
129	16,641	11.358
130	16,900	11.402
131	17,161	11.446
132	17,424	11.489
133	17,689	11.533
134	17,956	11.576
135	18,225	11.619
136	18,496	11.662
137	18,769	11.705
138	19,044	11.747
139	19,321	11.790
140	19,600	11.832
141	19,881	11.874
142	20,164	11.916
143	20,449	11.958
144	20,736	12.000
145	21,025	12.042
146	21,316	12.083
147	21,609	12.124
148	21,904	12.166
149	22,201	12.207
150	22,500	12.247

Table of Trigonometric Ratios

Angle	Sine	Cosine	Tangent
1°	.0175	.9998	.0175
2°	.0349	.9994	.0349
3°	.0523	.9986	.0524
4°	.0698	.9976	.0699
5°	.0872	.9962	.0875
6°	.1045	.9945	.1051
7°	.1219	.9925	.1228
8°	.1392	.9903	.1405
9°	.1564	.9877	.1584
10°	.1736	.9848	.1763
11°	.1908	.9816	.1944
12°	.2079	.9781	.2126
13°	.2250	.9744	.2309
14°	.2419	.9703	.2493
15°	.2588	.9659	.2679
16°	.2756	.9613	.2867
17°	.2924	.9563	.3057
18°	.3090	.9511	.3249
19°	.3256	.9455	.3443
20°	.3420	.9397	.3640
21°	.3584	.9336	.3839
22°	.3746	.9272	.4040
23°	.3907	.9205	.4245
24°	.4067	.9135	.4452
25°	.4226	.9063	.4663
26°	.4384	.8988	.4877
27°	.4540	.8910	.5095
28°	.4695	.8829	.5317
29°	.4848	.8746	.5543
30°	.5000	.8660	.5774
31°	.5150	.8572	.6009
32°	.5299	.8480	.6249
33°	.5446	.8387	.6494
34°	.5592	.8290	.6745
35°	.5736	.8192	.7002
36°	.5878	.8090	.7265
37°	.6018	.7986	.7536
38°	.6157	.7880	.7813
39°	.6293	.7771	.8098
40°	.6428	.7660	.8391
41°	.6561	.7547	.8693
42°	.6691	.7431	.9004
43°	.6820	.7314	.9325
44°	.6947	.7193	.9657
45°	.7071	.7071	1.0000

Angle	Sine	Cosine	Tangent
46°	.7193	.6947	1.0355
47°	.7314	.6820	1.0724
48°	.7431	.6691	1.1106
49°	.7547	.6561	1.1504
50°	.7660	.6428	1.1918
51°	.7771	.6293	1.2349
52°	.7880	.6157	1.2799
53°	.7986	.6018	1.3270
54°	.8090	.5878	1.3764
55°	.8192	.5736	1.4281
56°	.8290	.5592	1.4826
57°	.8387	.5446	1.5399
58°	.8480	.5299	1.6003
59°	.8572	.5150	1.6643
60°	.8660	.5000	1.7321
61°	.8746	.4848	1.8040
62°	.8829	.4695	1.8807
63°	.8910	.4540	1.9626
64°	.8988	.4384	2.0503
65°	.9063	.4226	2.1445
66°	.9135	.4067	2.2460
67°	.9205	.3907	2.3559
68°	.9272	.3746	2.4751
69°	.9336	.3584	2.6051
70°	.9397	.3420	2.7475
71°	.9455	.3256	2.9042
72°	.9511	.3090	3.0777
73°	.9563	.2924	3.2709
74°	.9613	.2756	3.4874
75°	.9659	.2588	3.7321
76°	.9703	.2419	4.0108
77°	.9744	.2250	4.3315
78°	.9781	.2079	4.7046
79°	.9816	.1908	5.1446
80°	.9848	.1736	5.6713
81°	.9877	.1564	6.3138
82°	.9903	.1392	7.1154
83°	.9925	.1219	8.1443
84°	.9945	.1045	9.5144
85°	.9962	.0872	11.4301
86°	.9976	.0698	14.3007
87°	.9986	.0523	19.0811
88°	.9994	.0349	28.6363
89°	.9998	.0175	57.2900