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MSPS Technician's Day
May 1, 2025

Part I

1) $2(x + 4y) = 18$, for x $x = 9 - 4y$	2) $\frac{2xy}{3} = 5z$, for x $x = \frac{15z}{2y}$
3) $R = \frac{l + 3w}{2}$, for w $w = \frac{2R - l}{3}$	4) $h = vt - 16t^2$, for v $v = \frac{h + 16t^2}{t}$
5) $C = \frac{5}{9}(F - 32)$, for F $F = \frac{9}{5}C + 32$	6) $A = p(1 + rt)$, for t $t = \frac{A - p}{pr}$
7) $A = \frac{1}{2h(b + c)}$, for b $b = \frac{1 - 2Ahc}{2Ah}$	8) $A = \frac{x + y + z}{2}$, for y $y = 2A - x - z$

Rewrite each equation in terms of the indicated (Letter).

1) $P = IRT$ **(T)**

2) $A = 2(L + W)$ **(W)**

3) $y = 5x - 6$ **(x)**

4) $2x - 3y = 8$ **(y)**

5) $\frac{x + y}{3} = 5$ **(x)**

6) $y = mx + b$ **(b)**

7) $ax + by = c$ **(y)**

8) $A = 1/2h(b + c)$ **(b)**

9) $V = LWH$ **(L)**

10) $A = 4\pi r^2$ **(r^2)**

11) $V = \pi r^2 h$ **(h)**

12) $7x - y = 14$ **(x)**

13) $A = \frac{x + y}{2}$ **(y)**

14) $R = \frac{E}{I}$ **(E)**

15) $x = \frac{yz}{6}$ **(z)**

16) $A = \frac{r}{2L}$ **(r)**

17) $A = \frac{a + b + c}{3}$ **(b)**

18) $12x - 4y = 20$ **(y)**

19) $x = \frac{2y - z}{4}$ **(z)**

20) $P = \frac{R - C}{N}$ **(R)**

Name_____

LAW OF SINES/ LAW OF COSINES

1. FORESTRY Lookout tower A is located 20.0 mi due north of tower B. The bearing of a fire from A is N41.0°E and the hearing of the fire from B is N22.0°E. How far is the fire from A? From B?

2. AERONAUTICS Statton Air Station is located due west of Jackson Field. An airplane leaves Statton and flies in a direction 125°20′. At the instant it is 350 mi from Statton, the direction to Jackson is 64°20′. What is the distance from Statton Air Station to Jackson Field?

3. SURVEYING Points A and B are on opposite sides of a canyon. Point C is 1.00 mi from A. The measure of ∠ BAC is 95°20′ and the measure of ∠ ACB is 34°50′. What is the distance between A and B?

4. NAVIGATION A boat sails 24.2 miles from port in a direction 31.0° and then 16.4 miles in a direction of 142.0°. At this time, how far is the boat from port?

5. SPORTS The distance from home plate to dead center field in Sun Devil Stadium is 408 ft. If a baseball diamond is a square and the distance from home plate to first base is 90 ft, how far is it from dead center field to first base?

Name_____

6. SPORTS A golfer tees off on a hole and slices his drive 21°00′ to the right of the line from the tee to the hole. If the distance from the tee to the hole is 360 yd and his drive went 215 yd, how long will his second shot need to be to reach the hole?

7. AERONAUTICS Jefferson City is 300 miles due south of Willville. A pilot flying from Jefferson City to Willville flies the first 200 miles off course in a direction of 9°00′. How far from Willville is he at this time?

8. CONSUMER A room in the shape of a triangle has sides of length 15.2 yd, 12.4 yd, and 11.8 yd. If carpeting costs $19.95 a square yard, padding costs $2.25 a square yard, and installation is included at no charge, how much, to the nearest dollar, will it cost to carpet the room over the padding, assuming there is no waste?

9. CONSUMER A sign painter wishes to make a sign in the shape of an isosceles triangle with equal sides of 12.0 yd and base angles of 65°. What is the area of the sign?

10. ENGINEERING An aluminum plate, 0.5 in thick, is triangular in shape and has sides of 11.0 inches, 15.5 inches, and 18.7 inches. What is the volume of the aluminum in the plate?