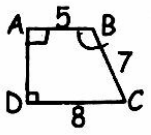
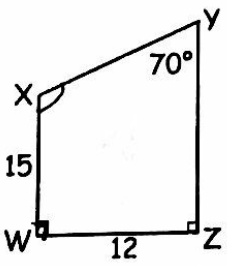
Key

2nd Semester Final Review

In questions 1-5, ABCD ~ WXYZ.





1. What is the scale factor of ABCD to WXYZ?

Scale Factor: 3

2. Find $m < A$

90°

3. Find $m < B$

110°

4. Find YZ

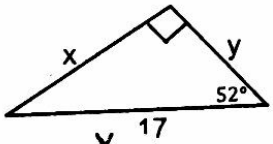
24

5. Find AD

4

Solve for the values of x and y by using trigonometric functions. Simplify your answers.

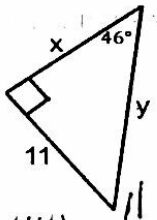
6.



$\sin(52) = \frac{x}{17}$ $x \approx 13.4$

$\cos(52) = \frac{y}{17}$ $y \approx 10.5$

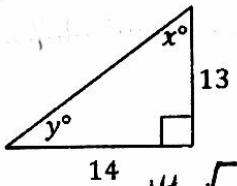
7.



$\tan(46) = \frac{11}{x}$ $\sin(46) = \frac{11}{y}$

$x \approx 10.6$, $y \approx 15.3$

8.

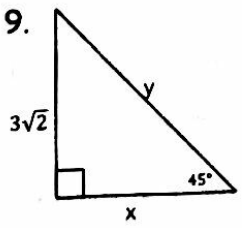


$\tan(x) = \frac{14}{13}$ $x \approx 47°$

$\tan(y) = \frac{13}{14}$ $x \approx 43°$

Determine the length of the missing values by using the properties of special right triangles. Show all your work and simplify your answers.

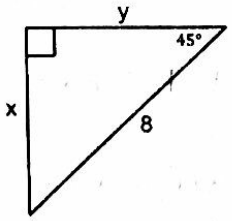
9.



$x = 3\sqrt{2}$

$y = 6$

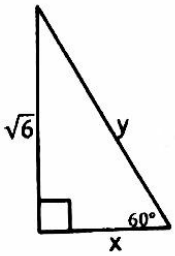
10.



$x = 4\sqrt{2}$

$y = 4\sqrt{2}$

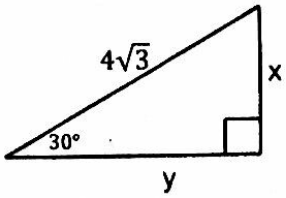
11.



$x = \sqrt{2}$

$y = 2\sqrt{2}$

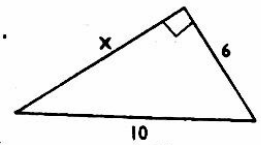
12.



$x = 2\sqrt{3}$

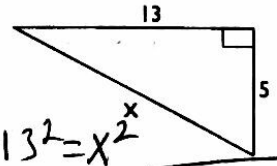
$y = 6$

Determine the length of the missing side by using the Pythagorean Theorem. Simplify your answers.

13. 

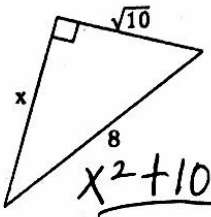
Triple

$X = 8$

14. 

$5^2 + 13^2 = x^2$

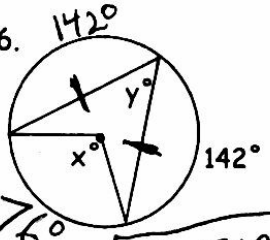
$25 + 169 = x^2$, $X = \sqrt{194}$

15. 

$x^2 + 10 = 64$

$X = 3\sqrt{6}$

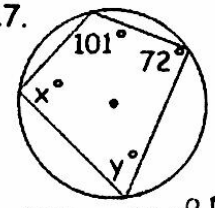
Solve for the value of x and y in each of the following.

16. 

76°

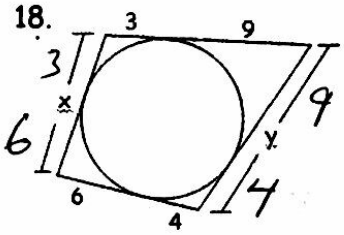
$X = 76°$

$Y = 38°$

17. 

$x + 72 = 180°$, $X = 108°$

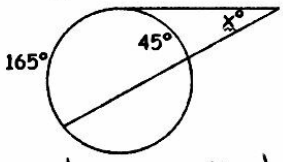
$y + 101 = 180°$, $y = 79°$

18. 

$X = 9$

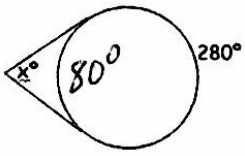
$Y = 13$

Write an equation to solve for the degree measures or length in each of the following.

19. 

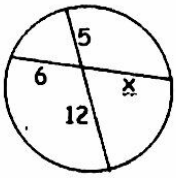
$X = \frac{1}{2}(165 - 45)$

$X = 60°$

20. 

$X = \frac{1}{2}(280 - 80)$

$X = 100°$

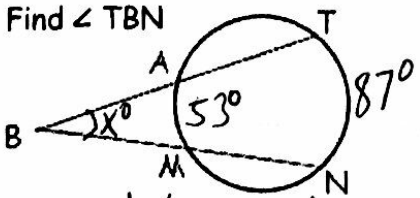
21. 

$6X = 60$

$X = 10$

Solve for the missing angle, arc measure or length. <u>Show work by writing an equation</u>.

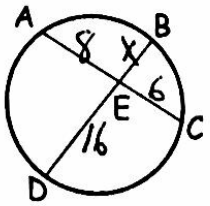
22. If m $\overset{\frown}{AM}$ = 53° and m $\overset{\frown}{TN}$ = 87°.
Find ∠ TBN



$X = \frac{1}{2}(87 - 53)$

$X = 17°$

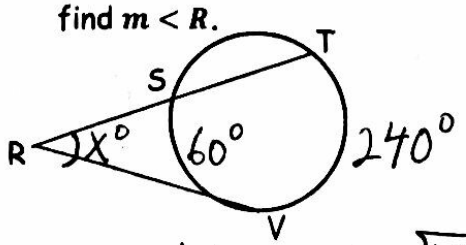
23. If $AE = 8$, $EC = 6$ and $DE = 16$, find BE.



$48 = 16x$

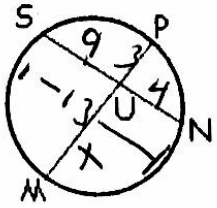
$X = 3$

24. If $m\overset{\frown}{TV} = 240°$ and $m\overset{\frown}{SU} = 60°$, find $m < R$.



$X = \frac{1}{2}(240 - 60) = 90°$

25. If SU = 9, PU = 3, and SN = 13. Find MU.

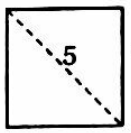


$36 = 3X$

$X = 12$

Find the area of each polygon. State the area formula you are using.

26.



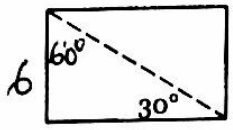
$\frac{5}{2}\sqrt{2}$

$A = s^2$

$= \left(\frac{5}{2}\sqrt{2}\right)^2$

$= \frac{25}{4} \cdot 2 = \boxed{\frac{25}{2}}$

27.



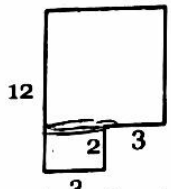
$6\sqrt{3}$

$A = b \cdot h$

$= 6 \cdot 6\sqrt{3}$

$= \boxed{36\sqrt{3}}$

28.



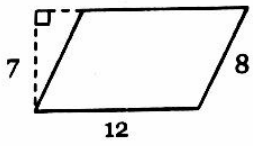
$A = (12 \cdot 6) + (2 \cdot 3)$

$= 36 + 6$

$= \boxed{42}$

$12 - 6 = 6$

29.

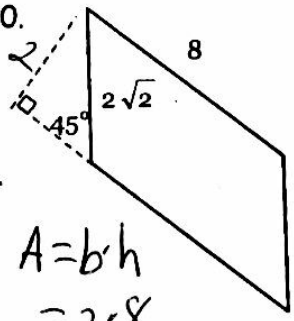


$A = b \cdot h$

$= 7 \cdot 12$

$= \boxed{84}$

30.

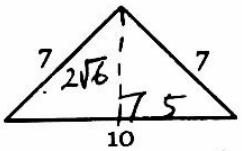


$A = b \cdot h$

$= 2 \cdot 8$

$= \boxed{16}$

31.

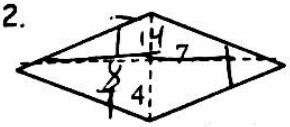


$A = \frac{1}{2} b \cdot h$

$= 10 \cdot 2\sqrt{6} \cdot \frac{1}{2}$

$= \boxed{10\sqrt{6}}$

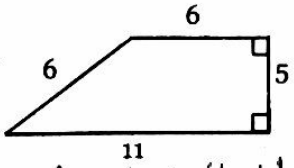
32.



$A = \frac{1}{2} d_1 d_2$

$= \frac{1}{2} \cdot 14 \cdot 8 = \boxed{56}$

33.

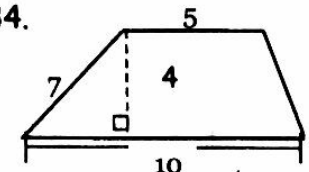


$A = \frac{1}{2} \cdot h(b_1 + b_2)$

$= \frac{1}{2} \cdot 5(6 + 11)$

$= \boxed{\frac{85}{2} = 42.5}$

34.

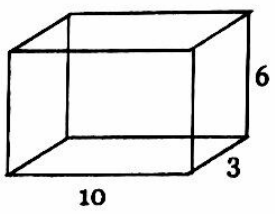


$A = \frac{1}{2} \cdot 4(10 + 5)$

$= \boxed{30}$

Calculate the listed values then find the values for the Lateral Area, Total Area, and Volume. Show your work and state all equations used.

35.



p = 26

h = 6

B = 30

L.A. = 156

$L.A. = P \cdot h$

$= 6 \cdot 26$

$= 156$

T.A. = 216

$T.A. = L.A. + 2B$

$= 156 + 2(30)$

$= 216$

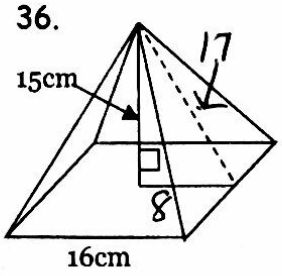
V = 180

$V = Bh$

$= 30 \cdot 6$

$= 180$

36.



p = 64
l = 17
h = 15
B = 256

L.A. = 544

$L.A. = \frac{1}{2}Pl$
$= \frac{1}{2} \cdot 64 \cdot 17$
$= 544$

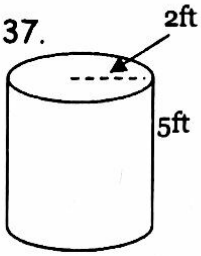
T.A. = 800

$T.A. = L.A. + B$
$= 544 + 256$
$= 800$

V = 1280

$V = \frac{1}{3}Bh$
$= \frac{1}{3} \cdot 256 \cdot 15$
$= 1280$

37.



r = 2
d = 4
h = 5
B = 4π

L.A. = 20π

$L.A. = \pi dh$
$= 4\pi \cdot 5$
$= 20\pi$

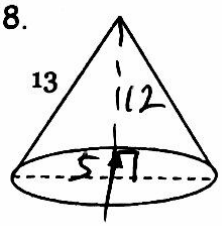
T.A. = 28π

$T.A. = L.A. + 2B$
$= 20\pi + 2(4\pi)$
$= 28\pi$

V = 20π

$V = \pi r^2 h$
$= 4\pi \cdot 5$
$= 20\pi$

38.



r = 5
h = 12
l = 13
B = 25π

L.A. = 65π

$L.A. = \pi rl$
$= 5\pi \cdot 13$
$= 65\pi$

T.A. = 90π

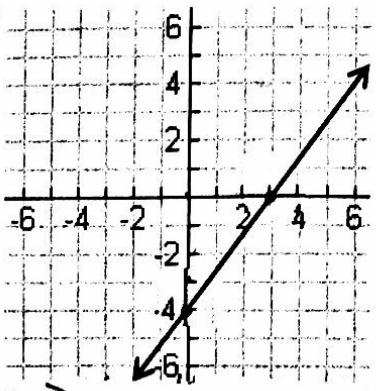
$T.A. = L.A. + B$
$= 65\pi + 25\pi$
$= 90\pi$

V = 100π

$V = \frac{1}{3}Bh$
$= \frac{1}{3} \cdot 25\pi \cdot 12$
$= 100\pi$

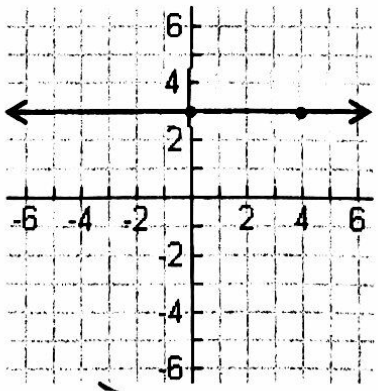
Write the equation of each graphed line in slope-intercept form.

39.



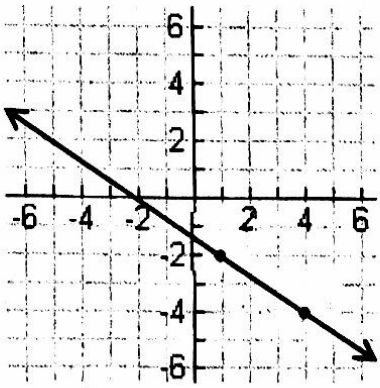
Eq. = $y = \frac{4}{3}x - 4$

40.



Eq. = $y = 3$

41.



Eq. = $y = -\frac{2}{3}x - 1.5$

Write the equation of each line in slope-intercept form using the given information.

42. $m = -2; (1, -4)$

$y - y_1 = m(x - x_1)$

$y + 4 = -2(x - 1)$

$\boxed{y = -2x - 2}$

43. (3, -1) and (-6, -4)

$m = \frac{-4-(-1)}{-6-3} = \frac{-3}{-9} = \frac{1}{3}$

$y + 1 = \frac{1}{3}(x - 3)$

$\boxed{y = \frac{1}{3}x - 2}$

44. (0, 4) and (2, 3) $m = \frac{3-4}{2-0} = -\frac{1}{2}$

$\boxed{y = -\frac{1}{2}x + 4}$

45. $m = -\frac{3}{2}; (2, 0)$

$y = -\frac{3}{2}(x - 2)$

$\boxed{y = -\frac{3}{2}x + 3}$

46. Horizontal line through (6, 8)

$\boxed{y = 8}$

47. Vertical line through (7, 10)

$\boxed{x = 7}$

48. Parallel to $y = 4x + 2$ through (2, 3) $m_{\parallel} = 4$

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

$y - 3 = 4x - 8$

$\boxed{y = 4x - 5}$

49. Perpendicular to $y = \frac{1}{2}x$ through (0, 5) $m_{\perp} = -2$

$\boxed{y = -2x + 5}$

50. Parallel to $y + 1 = -3(x - 3)$ through (4, -4) $m_{\parallel} = -3$

$y + 4 = -3(x - 4)$

$y + 4 = -3x + 12$

$\boxed{y = -3x + 8}$

Write the equation of the described circle.

51. Center $(0, 0)$, radius 1

$\boxed{x^2 + y^2 = 1}$

52. Center $(-3, 2)$, radius 4

$\boxed{(x+3)^2 + (y-2)^2 = 16}$

53. Center (0, 5), diameter 10

$\boxed{x^2 + (y-5)^2 = 25}$

54. Center (-6, 0), diameter 14

$\boxed{(x+6)^2 + y^2 = 49}$

55. Tangent to the y-axis with center (3, 5) $r = 3$

$\boxed{(x-3)^2 + (y-5)^2 = 9}$

56. Tangent to the x-axis with center (5, 2)

$r = 2$

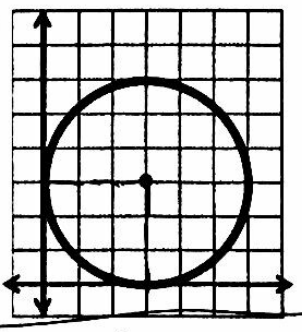
$\boxed{(x-5)^2 + (y-2)^2 = 4}$

57. Center (-1, 3), point on the circle (-5, 11)

$r = \sqrt{(-1-(-5))^2 + (3-11)^2} = \sqrt{16 + 64} = \sqrt{80} = 4\sqrt{5}$

$\boxed{(x+1)^2 + (y-3)^2 = 80}$

58.



$r = 3$

$C: (3, 3)$

$\boxed{(x-3)^2 + (y-3)^2 = 9}$

59. Diameter with endpoints (4, 6) and (12, 12)

$C = \left(\frac{4+12}{2}, \frac{6+12}{2}\right) = (8, 9)$

$r = \sqrt{(8-4)^2 + (9-6)^2} = \sqrt{25} = 5$

$\boxed{(x-8)^2 + (y-9)^2 = 25}$

Identify each sequence as arithmetic or geometric.

60. 2, 6, 18, 54, 162, ...

61. 3, 7, 11, 15, 19, ...

62. 96, 48, 24, 12, 6, ...

60. Geometric

61. Arithmetic

62. Geometric

For #4 – 6, use the arithmetic sequence 10, 17, 24, 31, 38, ...

63. Write a recursive formula that represents the sequence.

64. Write an explicit formula that represents the sequence.

65. Find the 40th term in the sequence.

$f(1) = 10;$

63. $f(x) = f(x-1) + 7$

64. $f(x) = 10 + 7(x-1)$

65. $f(40) = 283$

$f(40) = 10 + 7(40-1)$
$= 10 + 7(39)$
$= 283$

For #7 – 9, use the geometric sequence 5, 10, 20, 40, 80, ...

66. Write a recursive formula that represents the sequence.

67. Write an explicit formula that represents the sequence.

68. Find the 10th term in the sequence.

$f(1) = 5;$

66. $f(x) = f(x-1) \cdot 2$

67. $f(x) = 5 \cdot 2^{(x-1)}$

68. $f(10) = 2560$

$f(10) = 5 \cdot 2^{(10-1)}$
$= 5 \cdot 2^9$
$= 5 \cdot 512$
$= 2560$