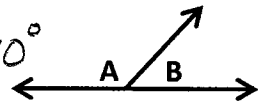
Name Key

Period _____

Secondary Math II: Final Review 2019

1. Simplify: $(9t^2 + 4t - 6) - (t^2 - 2t + 4)$ $9t^2+4t-6-t^2+2t-4$ $8t^2+6t-10$	2. Simplify: $3x(4x^2 - 2x - 5)$ $12x^3-6x^2-15x$
3. Multiply: $(x + 3)(x - 5)$ $x^2-2x-15$	4. Multipy: $(x - 6)^2$ $x^2-12x+36$
5. Simplify: $7x^{-5}$ $\frac{7}{x^5}$	6. Simplify: $i^2=-1$ $-5i(7 + 3i)$ $-35i-15i^2$ $\boxed{15-35i}$
7. Simplify: $(5x)^2$ $25x^2$	8. Simplify: $\frac{m^{15}}{m^9}$ m^6
9. Simplify: $(4x^3)(-2x^5)$ $-8x^8$	10. Simplify: $(3d^5)^4$ $81d^{20}$
11. Simplify: $16x^2y^0$ $16x^2$	12. Simplify: $(m^2 + 4m - 6) + (3m^3 - 2m + 10)$ $3m^3+m^2+2m+4$
13. Choose an equation that fits the given information. **Circle: Center (3, -2), Radius = 4** a) $(x+3)^2 + (y+2)^2 = 16$ $(x-3)^2+(y+2)^2=16$ b) $(x-3)^2 + (y+2)^2 = 16$ c) $(x-3)^2 + (y-2)^2 = 8$ d) $(x+3)^2 + (y-2)^2 = 16$	14. Choose an equation that fits the given information. **Absolute Value: $a = -2$, Vertex $(-4, 2)$** a) $y = 2\|x - 4\| + 2$ b) $y = -2\|x - 4\| - 2$ $y=-2\|x+4\|+2$ c) $y = -2\|x + 4\| + 2$ d) $y = 2\|x + 4\| + 2$
15. Choose an equation that fits the given information. **Parabola: $a = 3$, Vertex $(0, 1)$** a) $y = 3x^2 + 1$ $y=3(x-0)^2+1$ b) $y = (x - 3)^2 + 1$ c) $y = 3x^2 - 1$ $y=3x^2+1$ d) $y = (x + 3)^2 + 1$	16. If $\angle A$ and $\angle B$ are a linear pair and the $m\angle A = (13x + 2)°$ and $m\angle B = (11x - 4)°$ what is the value of x? $13x+2+11x-4=180°$  $24x-2=180°$ $24x=182$ $x=7.6$

17. Solve the following system.

$y = x^2 + 2x + 7$

$y = 6x + 3$

$6x+3 = x^2+2x+7$

$0 = x^2-4x+4$

$0 = (x-2)(x-2)$

$x = 2$

$\boxed{(2, 15)}$

18. Solve the following system.

$5x + 4y = -12$

$x - 2y = -8$

$5x+4y = -12$

$2x-4y = -16$

$7x = -28$

$x = -4$

$(-4, 2)$

19. Factor:

$x^2 + 4x - 12$

$(x+6)(x-2)$

20. What is the vertex of the function $y = x^2 - 6$?

$(0, -6)$

21. Solve:

$2x^2 + 5x - 7 = 0$

$(2x+7)(x-1) = 0$

$x = -\frac{7}{2}, 1$

22. What are the x-intercepts of the function $y = x^2 + 11x - 26$?

$y = (x+13)(x-2)$

$x = -13 \quad x = 2$

$(-13, 0) \quad (2, 0)$

23. Factor:

$x^2 - 36$

$(x+6)(x-6)$

24. Write the equation of the axis of symmetry for the function $y = -x^2 + 6x - 8$?

$x = -\frac{b}{2a} = \frac{-6}{2(-1)} = 3$

25. Given the parent function $f(x) = x^2$. Name the transformation to create $g(x) = (x-2)^2 - 7$.

Right 2 down 7

26. Simplify: $(4 - 3i)(7 - 6i)$

$28 - 24i - 21i + 18i^2$

$28 - 45i - 18$

$\boxed{10 - 45i}$

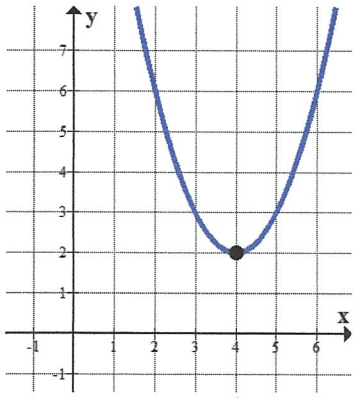
27. Which function models the graph?

$y = (x+4)^2 + 2$

$y = (x+2)^2 + 4$

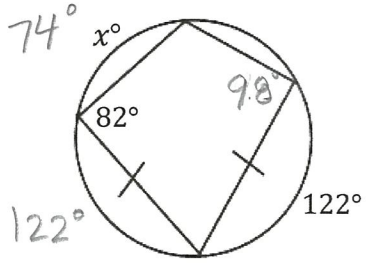
$y = (x-4)^2 + 2$

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



V: (4, 2)

28. Solve for x:



29. Solve:

$x^2 - 6x = -15$

$x^2 - 6x + 15 = 0$

$x = \frac{6 \pm \sqrt{36 - 4(1)(15)}}{2(1)}$

$x = \frac{6 \pm \sqrt{-24}}{2} = \frac{6 \pm 2i\sqrt{6}}{2} = \boxed{3 \pm i\sqrt{6}}$

30. Solve:

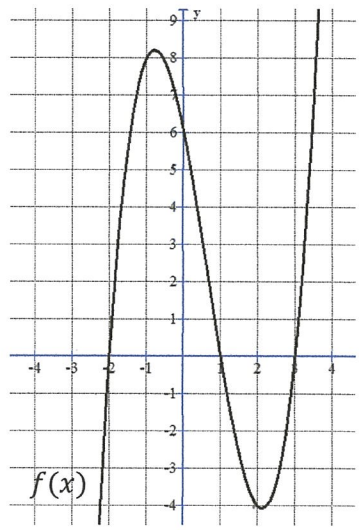
$2x^2 + 4x - 7 = 0$

$x = \frac{-4 \pm \sqrt{16 - 4(2)(-7)}}{2(2)}$

$x = \frac{-4 \pm \sqrt{72}}{4} = \frac{-4 \pm 6\sqrt{2}}{4} = \frac{-2 \pm 3\sqrt{2}}{2}$

Use the graph of the function $f(x)$ to answer the following questions.

For question 31 and 32:



31. $f(2) = ?$ -4

32. Find x when $f(x) = 0$

$x = -2, 1, 3$

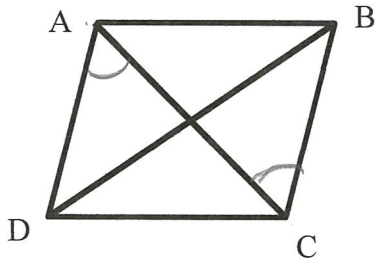
33. Given ▱ ABCD.

If $\angle ACB = (7x - 23)°$ and $\angle CAD = (3x + 9)°$, solve for x.

$7x - 23 = 3x + 9$

$4x = 32$

$x = 8$

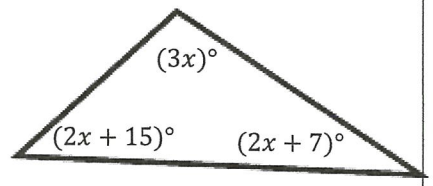


34. Solve for x:

$7x + 22 = 180$

$7x = 158$

$x = 22.6$



35. Line m and n are parallel. Which statement is false?

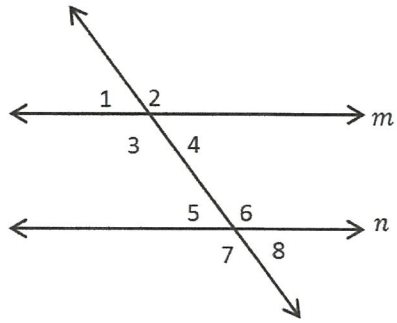
$\angle 1$ *and* $\angle 2$ *are a linear pair*

$\angle 1$ *and* $\angle 8$ *are alternating exterior angles*

$\angle 4$ *and* $\angle 6$ *are consecutive interior angles*

$\angle 3$ *and* $\angle 5$ *are vertical angles*

None are false



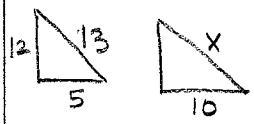
36. A building casts a shadow 50 m long. At the same time, a pole 8 meters high casts a shadow 18 m long. What is the height of the building?

$\frac{x}{50} = \frac{8}{18}$

$18x = 400$

$x = 22.2\,m$

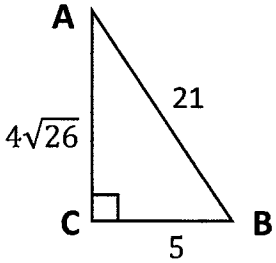
37. The sides of a triangle are 5, 12, and 13. Find the length of the longest side of a similar triangle whose shortest side is 10.



$\frac{5}{10} = \frac{13}{x}$ $\quad x = 26$

38. Find the value of $Cos B$.

$\cos B = \frac{5}{21}$



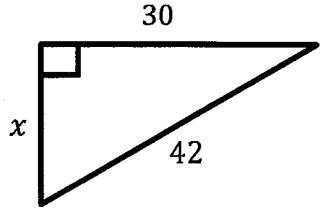
39. Solve for x.

$x^2 + 30^2 = 42^2$

$x^2 = 864$

$x = \sqrt{864}$

$x = 12\sqrt{6} \approx 29.4$

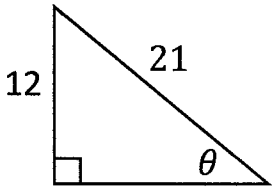


40. Solve for θ. Round to the nearest degree.

$\sin\theta = \frac{12}{21}$

$\sin^{-1}\left(\frac{12}{21}\right) = \theta$

$\theta = 34.8°$

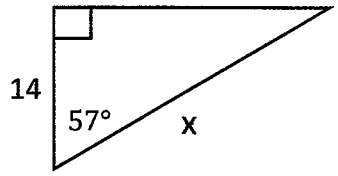


41. Solve for x.

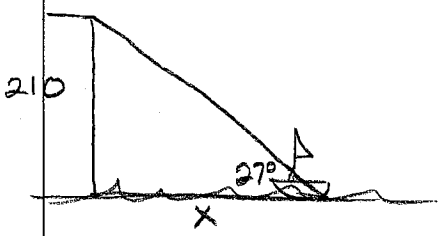
$\cos 57° = \frac{14}{x}$

$x = \frac{14}{\cos 57°}$

$x = 25.7$



42. From the top of a lighthouse 210 ft high, the angle of depression to a boat is 27°. Find the distance from the boat to the foot of the lighthouse.

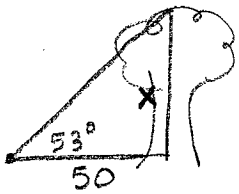


$\tan 27° = \frac{210}{x}$

$x = \frac{210}{\tan 27°}$

$x = 412.15\ ft$

43. At a point on the ground 50 ft. from the foot of a tree, the angle of elevation to the top of the tree is 53°. Find the height of the tree.



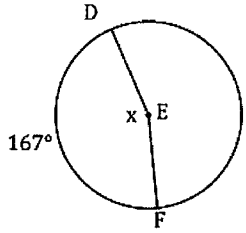
$\tan 53° = \frac{x}{50}$

$50 \tan 53° = x$

$x = 66.35\ ft$

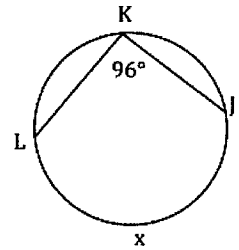
44. Solve for x.

167°



45. Solve for x.

192°



46. Solve the proportion $\frac{10}{x-5} = \frac{8}{x+3}$.

$10x + 30 = 8x - 40$

$2x = -70$

$x = -35$

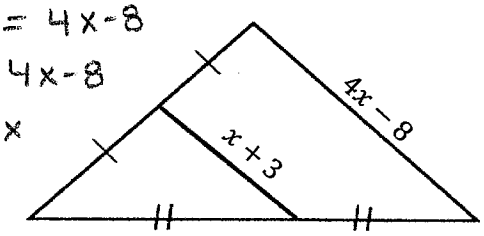
47. Solve for x.

$2(x+3) = 4x - 8$

$2x + 6 = 4x - 8$

$14 = 2x$

$x = 7$



48. Given △ABC where A(2, -3), B(-11, -4), C(5, 2), Find B".

Translation: $(x, y) \rightarrow (x + 2, y + 1)$

Dilation: $(x, y) \rightarrow \left(\frac{1}{3}x, \frac{1}{3}y\right)$

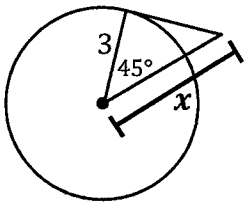
B(-11, -4) B′(-9, -3) B″(-3, -1)

49. Factor Completely: $16x^2 - 4x$

$4x(4x - 1)$

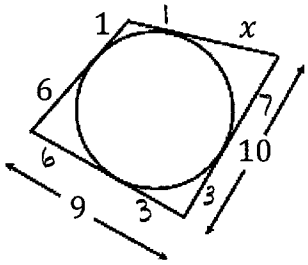
50. Solve for x. All lines that appear to be tangent are.

$3\sqrt{2}$



51. Solve for x. All lines that appear to be tangent are.

$x = 7$



52. A parabolic arch bridge is modeled by the equation
$y = -.15x(x - 45)$.
How wide is the base of the arch?

45 units