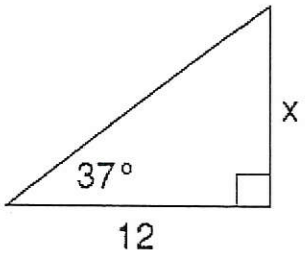
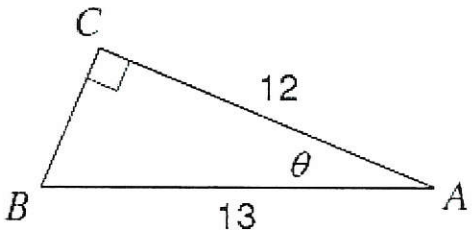
Name: Key Hr:

Sage Review
Practice #4

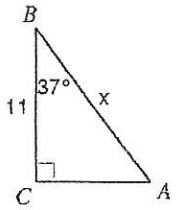
Solve for the missing variables. Round sides to one decimal place and angles to whole numbers.

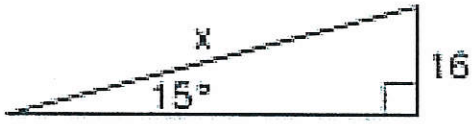




1. 9.0

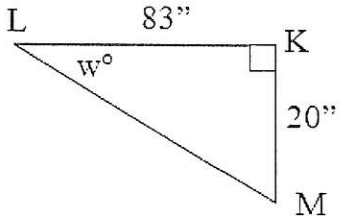
2. 23°





3. 13.8

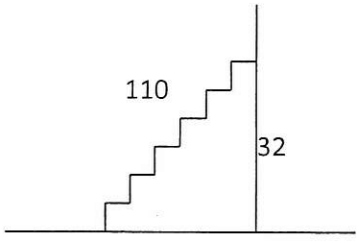
4. 61.8



5. 14°

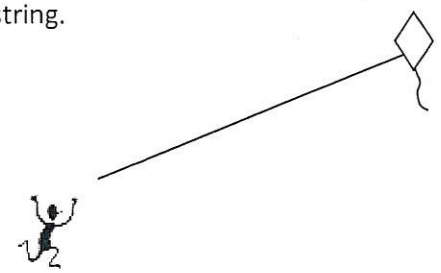
6. An escalator from the ground floor to the second floor of a department store is 110 ft long and rises 32 ft. vertically. What is the escalator's angle of elevation?

17°



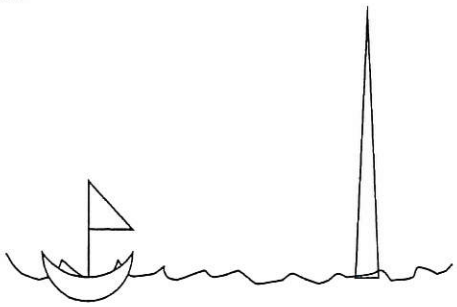
7. Richard is flying a kite. The kite string has an angle of elevation of 57°. If Richard is standing 100 feet from the point on the ground directly below the kite, find the length of the kite string.

183.6



8. From the top of a lighthouse 210 feet high, the angle of depression of a boat is 27°. Find the distance from the boat to the foot of the lighthouse. The lighthouse was built at sea level.

412.1



9. Factor the expression shown.

$$x^8 - y^8$$

Ⓐ $(x^4 - y^4)(x^4 + y^4)$

Ⓑ $(x^2 - y^2)(x^2 + y^2)(x^4 + y^4)$

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

Ⓓ This expression cannot be factored.

10. Which expression is equivalent to $x^2 + 64$?

Ⓐ $(x + 8i)(x + 8i)$

Ⓑ $(x - 8)(x + 8)$

● $(x + 8i)(x - 8i)$

Ⓓ $(x + 64)(x - 64)$

11. Factor the expression.

$7x^3 - 6x^2 + 28x - 24$

A) $(7x+4)(x^2+6)$ B) $(7x+4)(x^2-6)$

C) $(x-2)(x+2)(x^2+6)$ D) $(x^2+4)(7x-6)$

12. Simplify

$(8x-3)^2$

A) $8x+9$ B) $64x^2+9$

D) $64x^2-48x+9$ D) $64x^2-9$

13. Find the inverse of the function.

$f(n) = 2 + \frac{7}{5}n$

A) $f^{-1}(n) = \frac{-5n+25}{9}$ B) $f^{-1}(n) = -\frac{1}{4}n - \frac{3}{4}$

C) $f^{-1}(n) = \frac{5}{7}n - \frac{10}{7}$ D) $f^{-1}(n) = -\frac{5}{3}n$

14. Find the average rate of change of each function over the given interval:

$f(x) = 3x - 2, \quad [0, 5]$ a) 1/3 b) 3 c) 11/5 d) -3

15. $g(t) = 4t + 1$
$f(t) = t^2 + 4t$
Find $g(t) - f(t)$

A) $t^3 - 4t^2 - 2t - 2$ B) $-t^2 + 1$

C) $-t^2 + 8t + 1$ D) $t^2 - 1$

16. $f(x) = 4x + 1$
$g(x) = x^2 - x$
Find $(f \circ g)(x)$

A) $4x^2 - 4x + 1$ B) $16x^2 - x + 1$

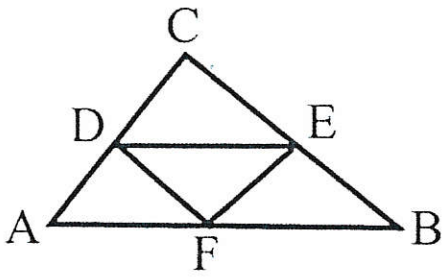
C) $4x^2 - 4x + 4$ D) $4x^3 - 3x^2 - x$

17. $h(a) = 2a + 3$
$g(a) = 3a + 5$
Find $(h \cdot g)(-6)$

A) 117 B) −23
C) 15 D) 96

18.

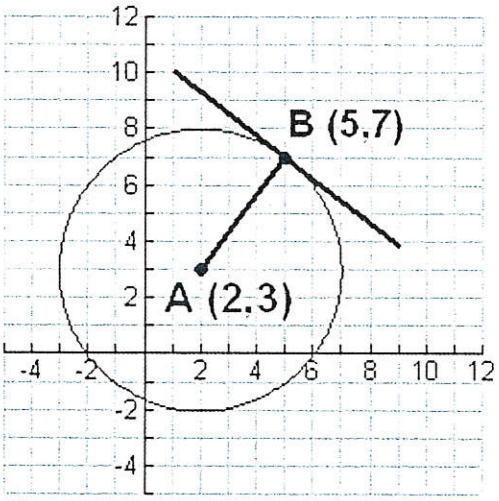
Given $AC = 42$, $CB = 46$, $AB = 48$.
D, E, F are midpoints.
Find the perimeter of triangle DEF.



Choose:

- 34
- 48
- 68
- 136

19.



The segment through point B is tangent to circle A.

What is the slope of $\overline{AB}$? 4/3

What is the slope of the tangent? -3/4

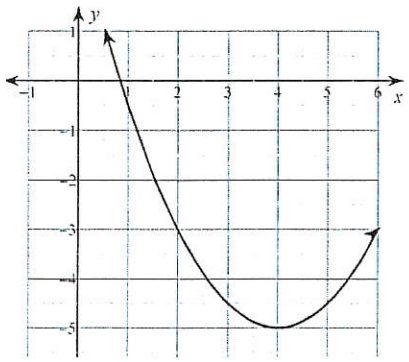
For questions 20-21. Use the information provided to write the vertex form equation of each parabola.

20.

Vertex: (3, 4), Passes through: (2, 6)

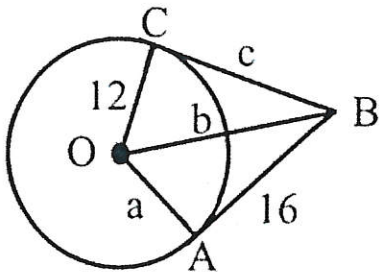
A) $y = 2(3x + 2)^2 + 4$ B) $y = 2(x + 3)^2 + 4$
C) $y = -2(x + 3)^2 - 4$ $y = 2(x - 3)^2 + 4$

21.



A) $y = -\frac{1}{2}(x + 3)^2 - 2$ $y = \frac{1}{2}(x - 4)^2 - 5$
C) $y = -\frac{1}{2}(x - 4)^2 - 5$ D) $y = \frac{1}{2}(x + 4)^2 - 5$

22.



$\overline{AB}, \overline{CB}$ tangents

$a = OA;\ b = OB;\ c = CB$

Find a, b, c.

Choose: $a =$

- 9
- 12
- 14
- 16

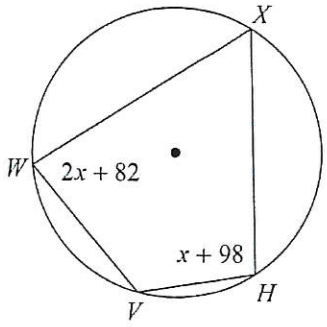
Choose: $b =$

- 16
- 18
- 20
- 24

Choose: $c =$

- 12
- 14
- 16
- 20

23. Find $m\widehat{VWX}$

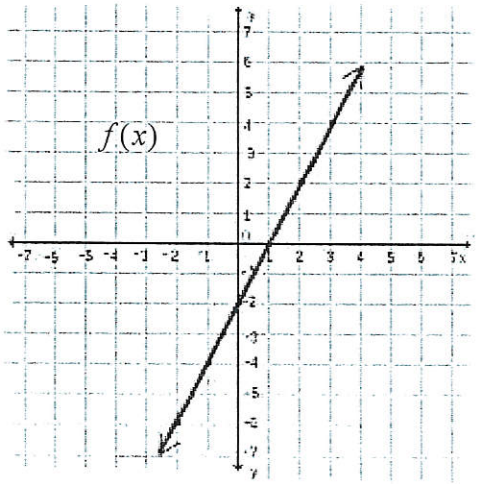


A) 231°
B) 196°
C) 209°
D) 256°

Given the Function $g(x) = 2x^2 - 1$, perform the indicated operations.

24. $f + g$

$2x^2 + 2x - 3$



25. $g - f$

$x^2 + 3$