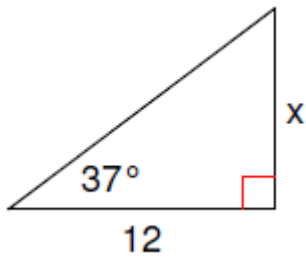
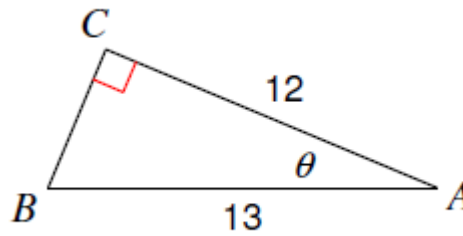


Sage Review  
Practice #4

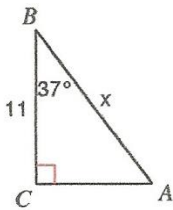
Solve for the missing variables. Round sides to one decimal place and angles to whole numbers.



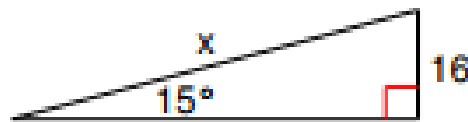
1. \_\_\_\_\_



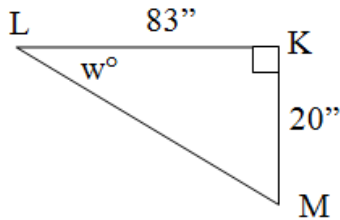
2. \_\_\_\_\_



3. \_\_\_\_\_

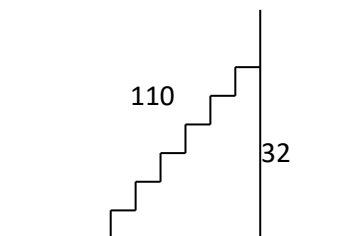


4. \_\_\_\_\_

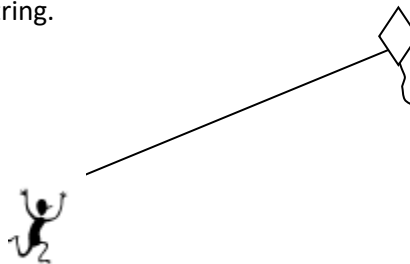


5. \_\_\_\_\_

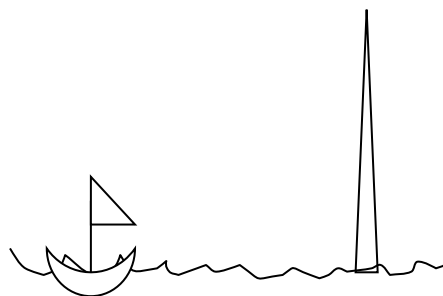
6. An escalator from the ground floor to the second floor of a department store is 110 ft long and rises 32 ft. vertically. What is the escalator's angle of elevation?



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



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



9. Factor the expression shown.

$$x^8 - y^8$$

- (A)  $(x^4 - y^4)(x^4 + y^4)$   
(B)  $(x^2 - y^2)(x^2 + y^2)(x^4 + y^4)$   
(C)  $(x - y)(x + y)(x^2 + y^2)(x^4 + y^4)$   
(D) This expression cannot be factored.
10. Which expression is equivalent to  $x^2 + 64$ ?

- (A)  $(x + 8i)(x + 8i)$   
(B)  $(x - 8)(x + 8)$   
(C)  $(x + 8i)(x - 8i)$   
(D)  $(x + 64)(x - 64)$

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)  $64x^2 + 9$

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

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)  $4x^2 - 4x + 4$

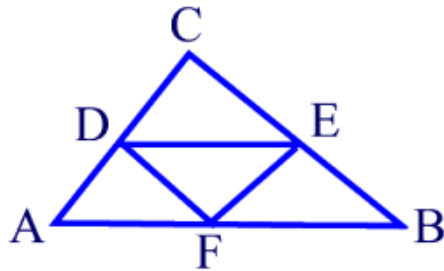
D)  $4x^3 - 3x^2 - x$

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

- A) 117      B) -23  
 C) 15        D) 96

18.

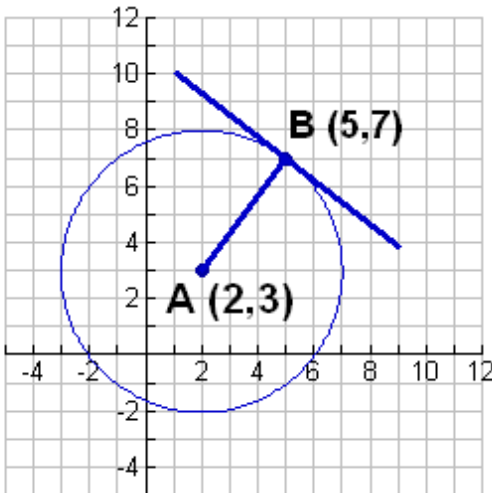
Given  $AC = 42$ ,  $CB = 46$ ,  $AB = 48$ .  
 $D, E, F$  are midpoints.  
 Find the perimeter of triangle  $DEF$ .



Choose:

- 34  
 48  
 68  
 136

19.



The segment through point B is tangent to circle A.

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

What is the slope of the tangent?

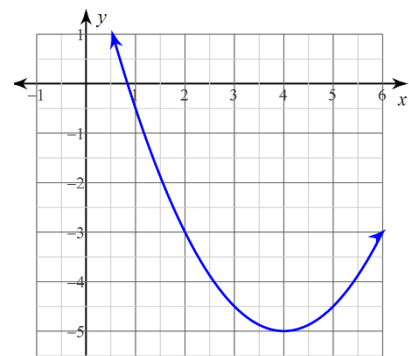
For questions 20-21. Use the information provided to write the vertex form equation of each parabola.

20.

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

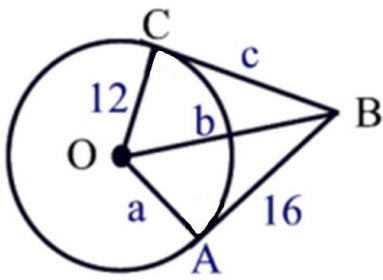
- A)  $y = 2(3x + 2)^2 + 4$       B)  $y = 2(x + 3)^2 + 4$   
 C)  $y = -2(x + 3)^2 - 4$       D)  $y = 2(x - 3)^2 + 4$

21.



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

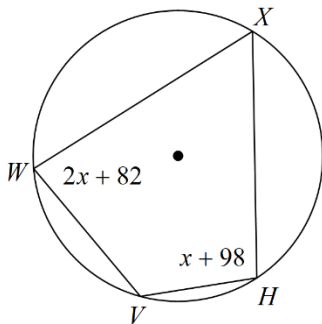
Choose:  $b =$

- 16
- 18
- 20
- 24

Choose:  $c =$

- 12
- 14
- 16
- 20

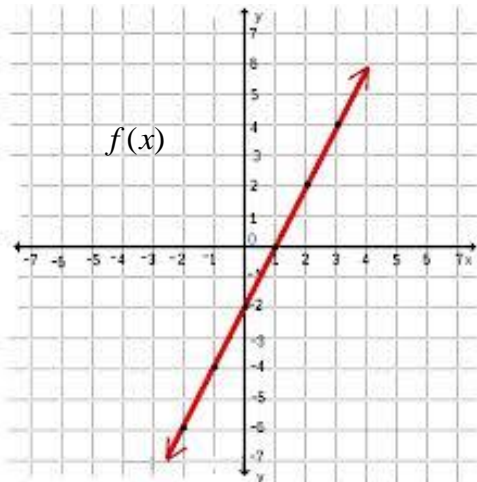
23. Find  $m\widehat{VWX}$



- A)  $231^\circ$
- B)  $196^\circ$
- C)  $209^\circ$
- D)  $256^\circ$

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

24.  $f + g$



25.  $g - f$

