Constructions: bisectors and perpendiculars worksheet – Grade 10

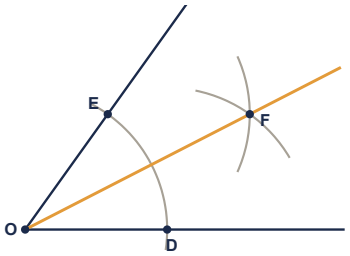
Grade 10 · Mixed level · 20 questions · **Version X3572**

Name: _____ Date: _____ Score: ___ / 20

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1. ∠AOB = 156° and OF is its bisector. What is ∠AOF, in degrees?



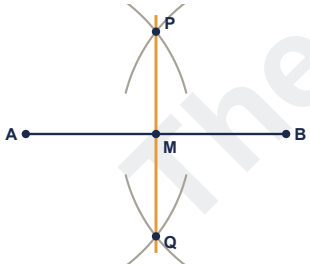
Answer: _____ °

2. To bisect segment AB with a compass, how wide should the opening be?

A. Exactly one quarter of AB **B.** Any width at all **C.** More than half of AB

D. Less than half of AB

3. AB = 34 cm. M is the point where the perpendicular bisector meets AB. How long is AM, in cm?



Answer: _____ cm

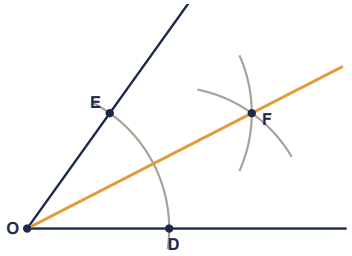
4. Which tools are used in a classic construction?

A. A protractor and a ruler with marks **B.** Graph paper only

C. A compass and a straightedge **D.** A calculator and a ruler

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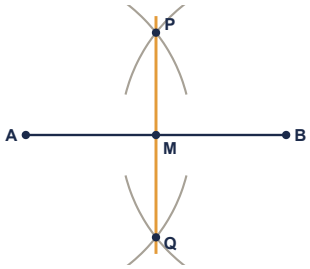
5. What does this compass construction make?



A. Equilateral triangle **B.** Triangle from three given sides

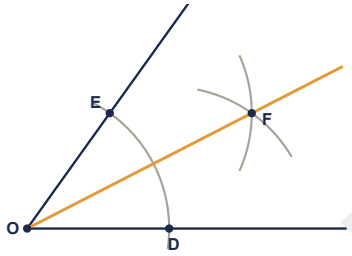
C. Perpendicular bisector of a segment **D.** Angle bisector

6. PQ is the perpendicular bisector of AB. What angle does PQ make with AB, in degrees?



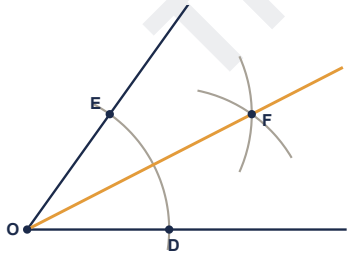
Answer: _____ °

7. ∠AOB = 20° and OF is its bisector. What is ∠AOF, in degrees?



Answer: _____ °

8. F is on the bisector of ∠AOB, and F is 23 cm from arm OA. How far is F from arm OB, in cm?



Answer: _____ cm

9. What is step 2 when constructing the angle bisector of ∠O?

A. Mark where those two arcs cross

B. From each cut, draw an arc with the same opening

C. Draw an arc from O that cuts both arms **D.** Join O to that crossing point

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10. Two towns, A and B, want a water tower the same distance from both. Which line holds every suitable point?

    A. The line AB **B.** The perpendicular bisector of AB **C.** A circle around A

    D. The bisector of any angle

11. A picnic table must be the same distance from two straight roads that meet. Which line holds every suitable point?

    A. The perpendicular bisector of the roads **B.** A circle around the corner

    C. One of the two roads **D.** The bisector of the angle between the roads

12. Two towns, A and B, want a fire hall the same distance from both. Which line holds every suitable point?

    A. The perpendicular bisector of AB **B.** A circle around A **C.** The bisector of any angle

    D. The line AB

13. Two towns, A and B, want a picnic table the same distance from both. Which line holds every suitable point?

    A. The bisector of any angle **B.** A circle around A **C.** The line AB

    D. The perpendicular bisector of AB

14. What is step 3 when constructing the regular hexagon in a circle?

    A. Step that length around the circle **B.** Draw a circle

    C. Keep the compass at the length of the radius **D.** Join the six marks in order

15. An angle of 150° is bisected, and then one half is bisected again. How large is the smallest angle now, in degrees?

    Answer: _____ °

16. A lamp post is 26 m from two houses that are 20 m apart. How far is it from the straight path between the houses, in m?

    Answer: _____ m

17. What is the slope of the perpendicular bisector of A(0, -6) and B(6, -4)?

    A. 3 **B.** −3 **C.** 0 **D.** 1/3

18. Find the slope of the perpendicular bisector of A(6, 4) and B(12, 6).

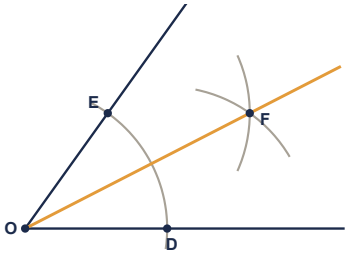
    A. −3 **B.** 1/3 **C.** 3 **D.** 0

19. Work out the slope of the perpendicular bisector of A(-6, 2) and B(-2, 4).

    A. 1/2 **B.** 0 **C.** −2 **D.** 2

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20. Why does the angle bisector construction work?



A. Arcs are always straight **B.** All angles are 60°

C. The two triangles it makes are congruent by SSS **D.** The arms are parallel

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Answer key · Version X3572

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1. **78**
2. **C (More than half of AB)**
3. **17**
4. **C (A compass and a straightedge)**
5. **D (Angle bisector)**
6. **90**
7. **10**
8. **23**
9. **B (From each cut, draw an arc with the same opening)**
10. **B (The perpendicular bisector of AB)**
11. **D (The bisector of the angle between the roads)**
12. **A (The perpendicular bisector of AB)**
13. **D (The perpendicular bisector of AB)**
14. **A (Step that length around the circle)**
15. **37.5**
16. **24**
17. **B (−3)**
18. **A (−3)**
19. **C (−2)**
20. **C (The two triangles it makes are congruent by SSS)**

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