15. The diagram indicates that $\overline{PT}$, $\overline{QT}$, and $\overline{RT}$ are perpendicular bisectors of $\triangle JKL$. According to the Concurrency of Perpendicular Bisectors Theorem, $JT = KT = LT$. Isosceles triangles have 2 sides of equal length, so the triangles formed by JT, KT, and LT are isosceles. These triangles are $\triangle JTL$, $\triangle JTK$, and $\triangle KTL$.

16. $\triangle ABC$ is circumscribed inside a circle. The center of the circle is the circumcenter of the triangle. The circumcenter of the triangle is the point where all three perpendicular bisectors intersect. By looking at the figure, we can see that the perpendicular bisectors of $\triangle ABC$ are $\overline{FT}$, $\overline{ET}$, and $\overline{DT}$. These perpendicular bisectors intersect at T, so according to the Concurrency of Perpendicular Bisectors T is the circumcenter of the triangle and the center of the circle.

17. A circle is inscribed inside $\triangle ABC$. By the Concurrency of Angle Bisectors, the center of an inscribed circle is the incenter of the triangle. The incenter is the point where all three angle bisectors meet. The diagram indicates that the angle bisectors of $\triangle ABC$ are $\overline{AP}$, $\overline{CP}$ and $\overline{BP}$. These the angle bisectors meet at P, so P is the center of the circle.

18. Given $TA = 8.2$. By the Concurrency of Perpendicular Bisectors Theorem, the perpendicular bisectors intersect at a point that is equidistant from the vertices. The perpendicular bisectors intersect at T, so T is equidistant from the vertices of the triangle. So, $TA = TB = TC = 8.2$.

19. By the Concurrency of Angle Bisectors Theorem, since $\overline{BG}$ and $\overline{AG}$ are angle bisectors of $\triangle ABC$, G is the incenter of $\triangle ABC$. Therefore $\overline{EG} \cong \overline{DG}$. The diagram indicates that $DG = 9$, so $EG = 9$.

20. By the Concurrency of Angle Bisectors Theorem, since $\overline{BG}$ and $\overline{AG}$ are angle bisectors of $\triangle ABC$, G is the incenter of $\triangle ABC$. Therefore $\overline{DG} \cong \overline{GF}$. The diagram indicates that $DG = 9$, so $GF = 9$.

21. Given $JQ = 5$. By Theorem 5-5, the center of a circumscribed circle is the circumcenter of the triangle. The circumcenter of a triangle is the point where the angle bisectors meet. Given $XY = 24$, we know that

$$XY = XJ + JY = 2JY$$
$$JY = 12$$

We can use the Pythagorean theorem to find QY, which is the angle bisector of Y.

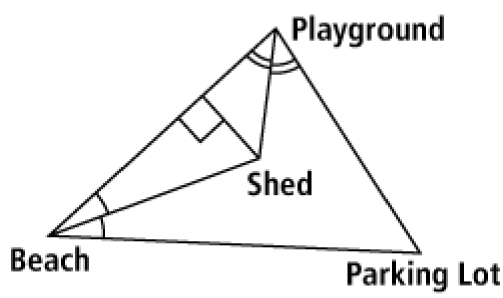
$$JY^2 + JQ^2 = QY^2$$
$$12^2 + 5^2 = QY^2$$
$$QY = \sqrt{12^2 + 5^2}$$
$$= \sqrt{169}$$
$$= 13$$

The radius of the circumscribed circle is 13.

22. The diagram indicates that $XZ = 22$, so $KZ = 11$. We showed in the previous problem that the angle bisectors have length 13, so $QZ = 13$. Now we can use the Pythagorean theorem to find QK.

$$QK^2 + KZ^2 = QZ^2$$
$$QK^2 + 11^2 = 13^2$$
$$QK = \sqrt{169 - 121}$$
$$= \sqrt{48}$$
$$\approx 6.9$$

23.



By Theorem 5-6, the point of intersection of the angle bisectors is equidistant from the sides, which represent the paths. So, the shed should be built at this point.