JEFFERSON MATH PROJECT
REGENTS BY DATE

The NY Geometry Regents Exams
Fall, 2008-January, 2010

(Answer Key)

www.jmap.org

Dear Sir

I have to acknolege the reciept of your favor of May 14. in which you mention that you have finished the 6. first books of Euclid, plane trigonometry, surveying & algebra and ask whether I think a further pursuit of that branch of science would be useful to you. there are some propositions in the latter books of Euclid, & some of Archimedes, which are useful, & I have no doubt you have been made acquainted with them. trigonometry, so far as this, is most valuable to every man, there is scarcely a day in which he will not resort to it for some of the purposes of common life. the science of calculation also is indispensible as far as the extraction of the square & cube roots; Algebra as far as the quadratic equation & the use of logarithms are often of value in ordinary cases: but all beyond these is but a luxury; a delicious luxury indeed; but not to be indulged in by one who is to have a profession to follow for his subsistence. in this light I view the conic sections, curves of the higher orders, perhaps even spherical trigonometry, Algebraical operations beyond the 2d dimension, and fluxions.

Letter from Thomas Jefferson to William G. Munford, Monticello, June 18, 1799.

fall08ge
Answer Section

1 ANS: 3
The diagonals of an isosceles trapezoid are congruent. $5x+3=11x-5$.

$$6x=18$$
$$x=3$$

PTS: 2 REF: fall0801ge STA: G.G.40 TOP: Trapezoids

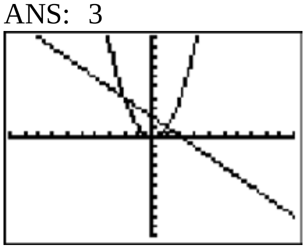
2 ANS: 4 PTS: 2 REF: fall0802ge STA: G.G.24
TOP: Negations

3 ANS: 1
$(x,y)\rightarrow(x+3,y+1)$

PTS: 2 REF: fall0803ge STA: G.G.54 TOP: Translations

4 ANS: 3 PTS: 2 REF: fall0804ge STA: G.G.18
TOP: Constructions

5 ANS: 3



PTS: 2 REF: fall0805ge STA: G.G.70 TOP: Quadratic-Linear Systems

6 ANS: 2 PTS: 2 REF: fall0806ge STA: G.G.9
TOP: Planes

7 ANS: 1 PTS: 2 REF: fall0807ge STA: G.G.19
TOP: Constructions

8 ANS: 3
The lateral edges of a prism are parallel.

PTS: 2 REF: fall0808ge STA: G.G.10 TOP: Solids

9 ANS: 1
Since $\overline{AC}\cong\overline{BC}$, $m\angle A=m\angle B$ under the Isosceles Triangle Theorem.

PTS: 2 REF: fall0809ge STA: G.G.69 TOP: Triangles in the Coordinate Plane

10 ANS: 4
Median $\overline{BF}$ bisects $\overline{AC}$ so that $\overline{CF}\cong\overline{FA}$.

PTS: 2 REF: fall0810ge STA: G.G.24 TOP: Statements

11 ANS: 3
Because $\overline{OC}$ is a radius, its length is 5. Since $CE=2$ $OE=3$. $\triangle EDO$ is a 3-4-5 triangle. If $ED=4$, $BD=8$.

PTS: 2 REF: fall0811ge STA: G.G.49 TOP: Chords

12 ANS: 2

The slope of a line in standard form is $-\frac{A}{B}$, so the slope of this line is 2. A parallel line would also have a slope of 2. Since the answers are in slope intercept form, find the y-intercept:

$$\begin{aligned} y &= mx+b \\ -11 &= 2(-3)+b \\ -5 &= b \end{aligned}$$

PTS: 2 REF: fall0812ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

13 ANS: 2

$M_x = \frac{2+(-4)}{2} = -1$. $M_Y = \frac{-3+6}{2} = \frac{3}{2}$.

PTS: 2 REF: fall0813ge STA: G.G.66 TOP: Midpoint

14 ANS: 3 PTS: 2 REF: fall0814ge STA: G.G.73
TOP: Equations of Circles

15 ANS: 1

$3x^2 + 18x + 24$

$3(x^2 + 6x + 8)$

$3(x+4)(x+2)$

PTS: 2 REF: fall0815ge STA: G.G.12 TOP: Volume

16 ANS: 3 PTS: 2 REF: fall0816ge STA: G.G.1
TOP: Planes

17 ANS: 2

$$\begin{aligned} x^2 &= 3(x+18) \\ x^2 - 3x - 54 &= 0 \\ (x-9)(x+6) &= 0 \\ x &= 9 \end{aligned}$$

PTS: 2 REF: fall0817ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: tangent and secant

18 ANS: 4 PTS: 2 REF: fall0818ge STA: G.G.61
TOP: Analytical Representations of Transformations

19 ANS: 2

$7 + 18 > 6 + 12$

PTS: 2 REF: fall0819ge STA: G.G.33 TOP: Triangle Inequality Theorem

20 ANS: 1

$M_x = \frac{-2+6}{2} = 2$. $M_y = \frac{3+3}{2} = 3$. The center is $(2,3)$. $d = \sqrt{(-2-6)^2 + (3-3)^2} = \sqrt{64+0} = 8$. If the diameter is 8, the radius is 4 and $r^2 = 16$.

PTS: 2 REF: fall0820ge STA: G.G.71 TOP: Equations of Circles

21 ANS: 1
$\triangle PRT$ and $\triangle SRQ$ share $\angle R$ and it is given that $\angle RPT \cong \angle RSQ$.

PTS: 2 REF: fall0821ge STA: G.G.44 TOP: Similarity Proofs

22 ANS: 4

$$3y + 1 = 6x + 4. \quad 2y + 1 = x - 9$$
$$3y = 6x + 3 \qquad 2y = x - 10$$
$$y = 2x + 1 \qquad y = \frac{1}{2}x - 5$$

PTS: 2 REF: fall0822ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

23 ANS: 1
After the translation, the coordinates are $A'(-1,5)$ and $B'(3,4)$. After the dilation, the coordinates are $A''(-2,10)$ and $B''(6,8)$.

PTS: 2 REF: fall0823ge STA: G.G.58 TOP: Compositions of Transformations

24 ANS: 4 PTS: 2 REF: fall0824ge STA: G.G.50
TOP: Tangents KEY: common tangency

25 ANS: 3 PTS: 2 REF: fall0825ge STA: G.G.21
TOP: Centroid, Orthocenter, Incenter and Circumcenter

26 ANS: 4
Corresponding angles of similar triangles are congruent.

PTS: 2 REF: fall0826ge STA: G.G.45 TOP: Similarity
KEY: perimeter and area

27 ANS: 4

$$(n-2)180 = (8-2)180 = 1080. \ \frac{1080}{8} = 135.$$

PTS: 2 REF: fall0827ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

28 ANS: 2
The slope of a line in standard form is $-\frac{A}{B}$ so the slope of this line is $-\frac{5}{3}$ Perpendicular lines have slope that are the opposite and reciprocal of each other.

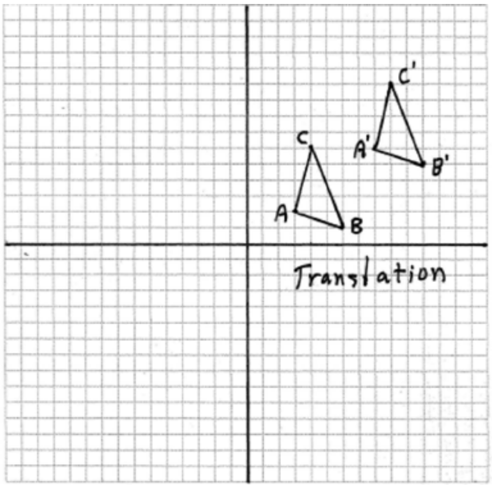
PTS: 2 REF: fall0828ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

29 ANS:

$$2\sqrt{3}. \ x^2 = 3 \cdot 4$$
$$x = \sqrt{12} = 2\sqrt{3}$$

PTS: 2 REF: fall0829ge STA: G.G.47 TOP: Similarity
KEY: altitude

30 ANS:



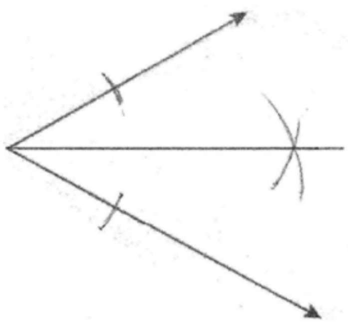
PTS: 2 REF: fall0830ge STA: G.G.55 TOP: Properties of Transformations

31 ANS:

25. $d=\sqrt{(-3-4)^2+(1-25)^2}=\sqrt{49+576}=\sqrt{625}=25$.

PTS: 2 REF: fall0831ge STA: G.G.67 TOP: Distance

32 ANS:



PTS: 2 REF: fall0832ge STA: G.G.17 TOP: Constructions

33 ANS:

22.4.

$$V=\pi r^2 h$$
$$12566.4=\pi r^2\cdot 8$$
$$r^2=\frac{12566.4}{8\pi}$$
$$r\approx 22.4$$

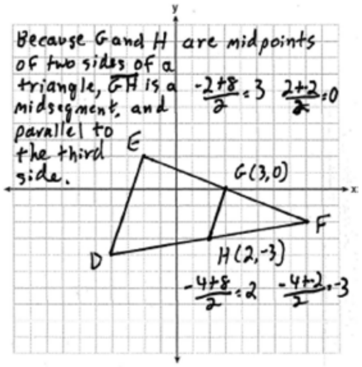
PTS: 2 REF: fall0833ge STA: G.G.14 TOP: Volume

34 ANS:

Contrapositive-If two angles of a triangle are not congruent, the sides opposite those angles are not congruent.

PTS: 2 REF: fall0834ge STA: G.G.26 TOP: Conditional Statements

35 ANS:



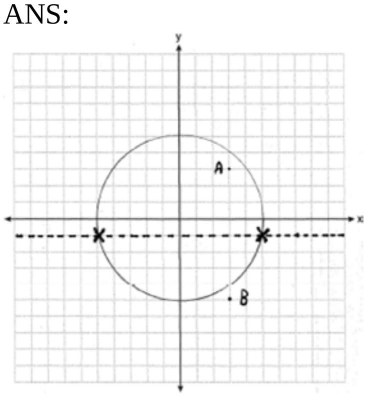
PTS: 4 REF: fall0835ge STA: G.G.42 TOP: Midsegments

36 ANS:

$\angle D$, $\angle G$ and 24° or $\angle E$, $\angle F$ and 84°. $\text{m}\overset{\frown}{FE} = \dfrac{2}{15} \times 360 = 48$. Since the chords forming $\angle D$ and $\angle G$ are intercepted by $\overset{\frown}{FE}$, their measure is 24°. $\text{m}\overset{\frown}{GD} = \dfrac{7}{15} \times 360 = 168$. Since the chords forming $\angle E$ and $\angle F$ are intercepted by $\overset{\frown}{GD}$, their measure is 84°.

PTS: 4 REF: fall0836ge STA: G.G.51 TOP: Arcs Determined by Angles
KEY: inscribed

37 ANS:



PTS: 4 REF: fall0837ge STA: G.G.23 TOP: Locus

38 ANS:

Because $\overline{AB} \parallel \overline{DC}$, $\overset{\frown}{AD} \cong \overset{\frown}{BC}$ since parallel chords intersect congruent arcs. $\angle BDC \cong \angle ACD$ because inscribed angles that intercept congruent arcs are congruent. $\overline{AD} \cong \overline{BC}$ since congruent chords intersect congruent arcs. $\overline{DC} \cong \overline{CD}$ because of the reflexive property. Therefore, $\triangle ACD \cong \triangle BDC$ because of SAS.

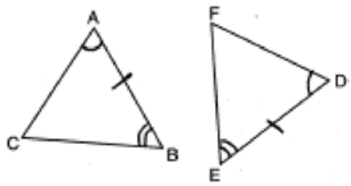
PTS: 6 REF: fall0838ge STA: G.G.27 TOP: Circle Proofs

0609ge
Answer Section

1 ANS: 1
If $\angle A$ is at minimum (50°) and $\angle B$ is at minimum (90°), $\angle C$ is at maximum of 40° (180° - (50° + 90°)). If $\angle A$ is at maximum (60°) and $\angle B$ is at maximum (100°), $\angle C$ is at minimum of 20° (180° - (60° + 100°)).

PTS: 2 REF: 060901ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

2 ANS: 3



PTS: 2 REF: 060902ge STA: G.G.28 TOP: Triangle Congruency

3 ANS: 1 PTS: 2 REF: 060903ge STA: G.G.56
TOP: Identifying Transformations

4 ANS: 4 PTS: 2 REF: 060904ge STA: G.G.13
TOP: Solids

5 ANS: 3 PTS: 2 REF: 060905ge STA: G.G.54
TOP: Reflections KEY: basic

6 ANS: 2
Parallel chords intercept congruent arcs. $m\overset{\frown}{AD} = m\overset{\frown}{BC} = 60$. $m\angle CDB = \dfrac{1}{2}m\overset{\frown}{BC} = 30$.

PTS: 2 REF: 060906ge STA: G.G.52 TOP: Chords

7 ANS: 2
The slope of $y = \dfrac{1}{2}x + 5$ is $\dfrac{1}{2}$. The slope of a perpendicular line is -2.

$$y = mx + b$$
$$5 = (-2)(-2) + b$$
$$b = 1$$

PTS: 2 REF: 060907ge STA: G.G.64 TOP: Parallel and Perpendicular Lines

8 ANS: 3 PTS: 2 REF: 060908ge STA: G.G.60
TOP: Identifying Transformations

9 ANS: 1
In an equilateral triangle, each interior angle is 60° and each exterior angle is 120° (180° - 120°). The sum of the three interior angles is 180° and the sum of the three exterior angles is 360°.

PTS: 2 REF: 060909ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

10 ANS: 2 PTS: 2 REF: 060910ge STA: G.G.71
TOP: Equations of Circles

11 ANS: 2
Longest side of a triangle is opposite the largest angle. Shortest side is opposite the smallest angle.

PTS: 2 REF: 060911ge STA: G.G.34 TOP: Angle Side Relationship

12 ANS: 4 PTS: 2 REF: 060912ge STA: G.G.23
TOP: Locus

13 ANS: 4 PTS: 2 REF: 060913ge STA: G.G.26
TOP: Contrapositive

14 ANS: 2
The centroid divides each median into segments whose lengths are in the ratio 2 : 1.

PTS: 2 REF: 060914ge STA: G.G.43 TOP: Centroid

15 ANS: 1
$\overline{AB} = 10$ since $\triangle ABC$ is a 6-8-10 triangle. $6^2 = 10x$

$3.6 = x$

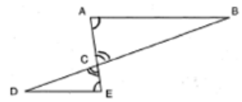
PTS: 2 REF: 060915ge STA: G.G.47 TOP: Similarity
KEY: leg

16 ANS: 3

$$4(x+4) = 8^2$$
$$4x + 16 = 64$$
$$x = 12$$

PTS: 2 REF: 060916ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: tangent and secant

17 ANS: 2

$\angle ACB$ and $\angle ECD$ are congruent vertical angles and $\angle CAB \cong \angle CED$. 

PTS: 2 REF: 060917ge STA: G.G.44 TOP: Similarity Proofs

18 ANS: 1 PTS: 2 REF: 060918ge STA: G.G.2
TOP: Planes

19 ANS: 4

$M_x = \dfrac{-6+1}{2} = -\dfrac{5}{2}$. $M_y = \dfrac{1+8}{2} = \dfrac{9}{2}$.

PTS: 2 REF: 060919ge STA: G.G.66 TOP: Midpoint

20 ANS: 1 PTS: 2 REF: 060920ge STA: G.G.74
TOP: Graphing Circles

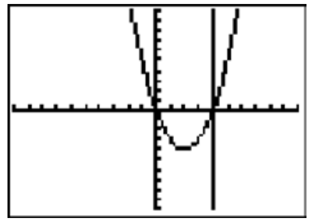
21 ANS: 1

$V = \dfrac{1}{3}\pi r^2 h = \dfrac{1}{3}\pi \cdot 4^2 \cdot 12 \approx 201$

PTS: 2 REF: 060921ge STA: G.G.15 TOP: Volume

22 ANS: 4 PTS: 2 REF: 060922ge STA: G.G.73
TOP: Equations of Circles

23 ANS: 1

$y = x^2 - 4x = (4)^2 - 4(4) = 0$. $(4,0)$ is the only intersection. 

PTS: 2 REF: 060923ge STA: G.G.70 TOP: Quadratic-Linear Systems

24 ANS: 4

(4) is not true if $\angle PQR$ is obtuse.

PTS: 2 REF: 060924ge STA: G.G.32 TOP: External Angle Theorem

25 ANS: 3 PTS: 2 REF: 060925ge STA: G.G.17

TOP: Constructions

26 ANS: 2

The slope of $2x + 3y = 12$ is $-\frac{A}{B} = -\frac{2}{3}$. The slope of a perpendicular line is $\frac{3}{2}$. Rewritten in slope intercept form, (2) becomes $y = \frac{3}{2}x + 3$.

PTS: 2 REF: 060926ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

27 ANS: 4

$$\triangle ABC \sim \triangle DBE. \quad \frac{\overline{AB}}{\overline{DB}} = \frac{\overline{AC}}{\overline{DE}}$$

$$\frac{9}{2} = \frac{x}{3}$$

$$x = 13.5$$

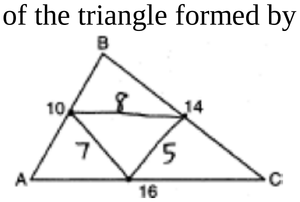
PTS: 2 REF: 060927ge STA: G.G.46 TOP: Side Splitter Theorem

28 ANS: 3 PTS: 2 REF: 060928ge STA: G.G.8

TOP: Planes

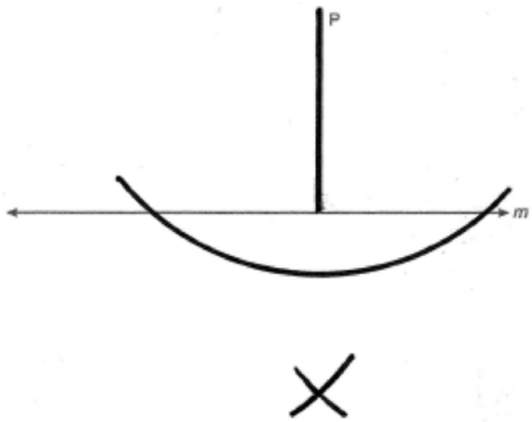
29 ANS:

20. The sides of the triangle formed by connecting the midpoints are half the sides of the original triangle.

$5 + 7 + 8 = 20.$ 

PTS: 2 REF: 060929ge STA: G.G.42 TOP: Midsegments

30 ANS:



PTS: 2 REF: 060930ge STA: G.G.19 TOP: Constructions

31 ANS:

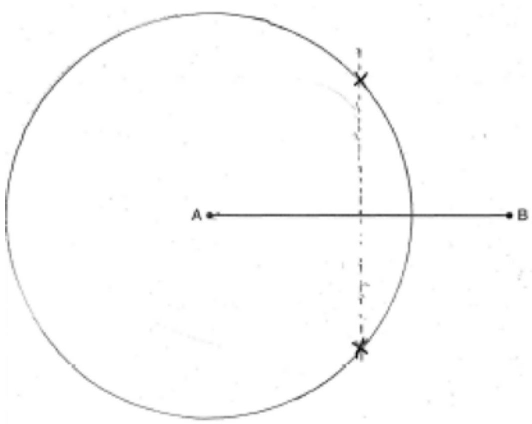
$y=-2x+14$. The slope of $2x+y=3$ is $\frac{-A}{B}=\frac{-2}{1}=-2$. $y=mx+b$.

$4=(-2)(5)+b$

$b=14$

PTS: 2 REF: 060931ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

32 ANS:



PTS: 2 REF: 060932ge STA: G.G.22 TOP: Locus

33 ANS:

True. The first statement is true and the second statement is false. In a disjunction, if either statement is true, the disjunction is true.

PTS: 2 REF: 060933ge STA: G.G.25 TOP: Compound Statements
KEY: disjunction

34 ANS:

20. $5x + 10 = 4x + 30$

$$x = 20$$

PTS: 2 REF: 060934ge STA: G.G.45 TOP: Similarity
KEY: basic

35 ANS:

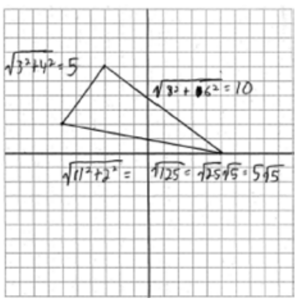
18. If the ratio of *TA* to *AC* is 1:3, the ratio of *TE* to *ES* is also 1:3. $x + 3x = 24$. $3(6) = 18$.

$$x = 6$$

PTS: 4 REF: 060935ge STA: G.G.50 TOP: Tangents
KEY: common tangency

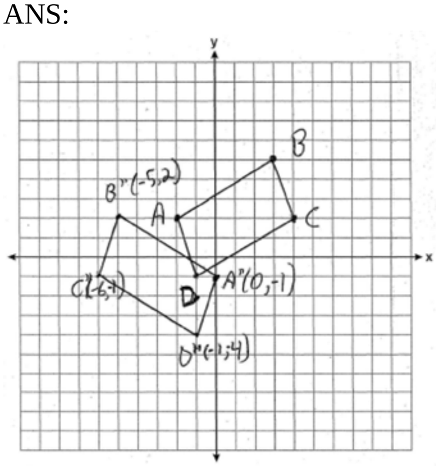
36 ANS:

$15 + 5\sqrt{5}$.



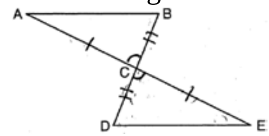
PTS: 4 REF: 060936ge STA: G.G.69 TOP: Triangles in the Coordinate Plane

37 ANS:



PTS: 4 REF: 060937ge STA: G.G.54 TOP: Compositions of Transformations
KEY: grids

38 ANS:
$\overline{AC} \cong \overline{EC}$ and $\overline{DC} \cong \overline{BC}$ because of the definition of midpoint. $\angle ACB \cong \angle ECD$ because of vertical angles. $\triangle ABC \cong \triangle EDC$ because of SAS. $\angle CDE \cong \angle CBA$ because of CPCTC. $\overline{BD}$ is a transversal intersecting $\overline{AB}$ and $\overline{ED}$. Therefore $\overline{AB} \parallel \overline{DE}$ because $\angle CDE$ and $\angle CBA$ are congruent alternate interior angles.



PTS: 6 REF: 060938ge STA: G.G.27 TOP: Triangle Proofs

0809ge
Answer Section

1 ANS: 4
The marked 60º angle and the angle above it are on the same straight line and supplementary. This unmarked supplementary angle is 120º. Because the unmarked 120º angle and the marked 120º angle are alternate exterior angles and congruent, $d \parallel e$.

PTS: 2 REF: 080901ge STA: G.G.35 TOP: Parallel Lines and Transversals

2 ANS: 3 PTS: 2 REF: 080902ge STA: G.G.17
TOP: Constructions

3 ANS: 4
$180 - (40 + 40) = 100$

PTS: 2 REF: 080903ge STA: G.G.31 TOP: Isosceles Triangle Theorem

4 ANS: 2
Parallel chords intercept congruent arcs. $m\overparen{AC} = m\overparen{BD} = 30$. $180 - 30 - 30 = 120$.

PTS: 2 REF: 080904ge STA: G.G.52 TOP: Chords

5 ANS: 4 PTS: 2 REF: 080905ge STA: G.G.29
TOP: Triangle Congruency

6 ANS: 2
A dilation affects distance, not angle measure.

PTS: 2 REF: 080906ge STA: G.G.60 TOP: Identifying Transformations

7 ANS: 1
$\angle DCB$ and $\angle ADC$ are supplementary adjacent angles of a parallelogram. $180 - 120 = 60$. $\angle 2 = 60 - 45 = 15$.

PTS: 2 REF: 080907ge STA: G.G.38 TOP: Parallelograms

8 ANS: 1
Translations and reflections do not afffect distance.

PTS: 2 REF: 080908ge STA: G.G.59 TOP: Properties of Transformations

9 ANS: 3
The slope of $y = x + 2$ is 1. The slope of $y - x = -1$ is $\frac{-A}{B} = \frac{-(-1)}{1} = 1$.

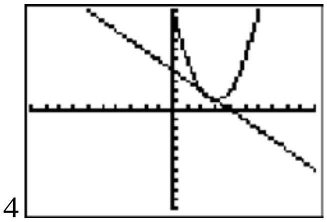
PTS: 2 REF: 080909ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

10 ANS: 2
$M_x = \frac{-2+6}{2} = 2$. $M_y = \frac{-4+2}{2} = -1$

PTS: 2 REF: 080910ge STA: G.G.66 TOP: Midpoint

11 ANS: 1 PTS: 2 REF: 080911ge STA: G.G.73
TOP: Equations of Circles

12 ANS: 4



$y+x=4$. $x^2-6x+10=-x+4$. $y+x=4$. $y+2=4$

$y=-x+4$ $\quad x^2-5x+6=0$ $\quad y+3=4$ $\quad y=2$

$(x-3)(x-2)=0$ $\quad y=1$

$x=3 \text{ or } 2$

PTS: 2 REF: 080912ge STA: G.G.70 TOP: Quadratic-Linear Systems

13 ANS: 3 PTS: 2 REF: 080913ge STA: G.G.28
TOP: Triangle Congruency

14 ANS: 4 PTS: 2 REF: 080914ge STA: G.G.7
TOP: Planes

15 ANS: 4 PTS: 2 REF: 080915ge STA: G.G.56
TOP: Identifying Transformations

16 ANS: 2
$6+17>22$

PTS: 2 REF: 080916ge STA: G.G.33 TOP: Triangle Inequality Theorem

17 ANS: 4
The slope of $y=-\frac{2}{3}x-5$ is $-\frac{2}{3}$. Perpendicular lines have slope that are opposite reciprocals.

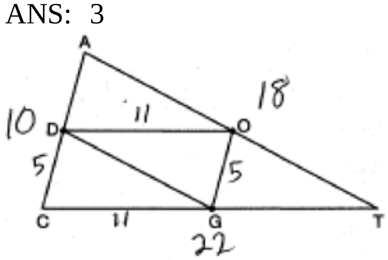
PTS: 2 REF: 080917ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

18 ANS: 1 PTS: 2 REF: 080918ge STA: G.G.41
TOP: Special Quadrilaterals

19 ANS: 1
$d=\sqrt{(-4-2)^2+(5-(-5))^2}=\sqrt{36+100}=\sqrt{136}=\sqrt{4}\cdot\sqrt{34}=2\sqrt{34}$.

PTS: 2 REF: 080919ge STA: G.G.67 TOP: Distance

20 ANS: 3



PTS: 2 REF: 080920ge STA: G.G.42 TOP: Midsegments

21 ANS: 2 PTS: 2 REF: 080921ge STA: G.G.72
TOP: Equations of Circles

22 ANS: 4
Let $\overline{AD} = x$. $36x = 12^2$

$x = 4$

PTS: 2 REF: 080922ge STA: G.G.47 TOP: Similarity
KEY: leg

23 ANS: 2

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

$16x - 12 = 6x + 24$

$10x = 36$

$x = 3.6$

PTS: 2 REF: 080923ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: two chords

24 ANS: 3 PTS: 2 REF: 080924ge STA: G.G.24
TOP: Negations

25 ANS: 4 PTS: 2 REF: 080925ge STA: G.G.21
TOP: Centroid, Orthocenter, Incenter and Circumcenter

26 ANS: 1

$V = \pi r^2 h$

$1000 = \pi r^2 \cdot 8$

$r^2 = \frac{1000}{8\pi}$

$r \approx 6.3$

PTS: 2 REF: 080926ge STA: G.G.14 TOP: Volume

27 ANS: 2 PTS: 2 REF: 080927ge STA: G.G.4
TOP: Planes

28 ANS: 3 PTS: 2 REF: 080928ge STA: G.G.50
TOP: Tangents KEY: common tangency

29 ANS:
3. The non-parallel sides of an isosceles trapezoid are congruent. $2x + 5 = 3x + 2$.

$x = 3$

PTS: 2 REF: 080929ge STA: G.G.40 TOP: Trapezoids

30 ANS:
2016. $V = \frac{1}{3}Bh = \frac{1}{3}s^2h = \frac{1}{3}12^2 \cdot 42 = 2016$

PTS: 2 REF: 080930ge STA: G.G.13 TOP: Volume

31 ANS:

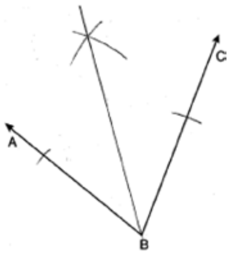
$y = \frac{2}{3}x - 9$. The slope of $2x - 3y = 11$ is $-\frac{A}{B} = \frac{-2}{-3} = \frac{2}{3}$. $-5 = \left(\frac{2}{3}\right)(6) + b$

$$-5 = 4 + b$$

$$b = -9$$

PTS: 2 REF: 080931ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

32 ANS:



PTS: 2 REF: 080932ge STA: G.G.17 TOP: Constructions

33 ANS:

26. $x + 3x + 5x - 54 = 180$

$$9x = 234$$

$$x = 26$$

PTS: 2 REF: 080933ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

34 ANS:

$\overline{AC}$. $m\angle BCA = 63$ and $m\angle ABC = 80$. $\overline{AC}$ is the longest side as it is opposite the largest angle.

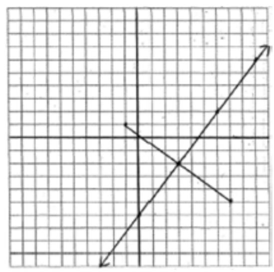
PTS: 2 REF: 080934ge STA: G.G.34 TOP: Angle Side Relationship

35 ANS:

$y = \frac{4}{3}x - 6.$ $M_x = \frac{-1+7}{2} = 3$ The perpendicular bisector goes through $(3,-2)$ and has a slope of $\frac{4}{3}$.

$M_y = \frac{1+(-5)}{2} = -2$

$m = \frac{1-(-5)}{-1-7} = -\frac{3}{4}$

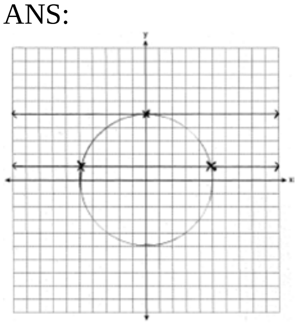


$y - y_M = m(x - x_M).$

$y - 1 = \frac{4}{3}(x-2)$

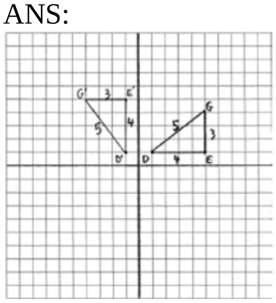
PTS: 4 REF: 080935ge STA: G.G.68 TOP: Perpendicular Bisector

36 ANS:



PTS: 4 REF: 080936ge STA: G.G.23 TOP: Locus

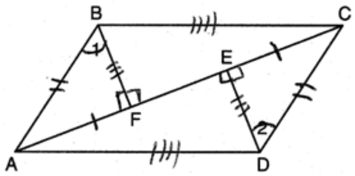
37 ANS:



$D'(-1,1), E'(-1,5), G'(-4,5)$

PTS: 4 REF: 080937ge STA: G.G.55 TOP: Properties of Transformations

38 ANS:



$\overline{FE} \cong \overline{FE}$ (Reflexive Property); $\overline{AE} - \overline{FE} \cong \overline{FC} - \overline{EF}$ (Line Segment Subtraction Theorem); $\overline{AF} \cong \overline{CE}$ (Substitution); $\angle BFA \cong \angle DEC$ (All right angles are congruent); $\triangle BFA \cong \triangle DEC$ (AAS); $\overline{AB} \cong \overline{CD}$ and $\overline{BF} \cong \overline{DE}$ (CPCTC); $\angle BFC \cong \angle DEA$ (All right angles are congruent); $\triangle BFC \cong \triangle DEA$ (SAS); $\overline{AD} \cong \overline{CB}$ (CPCTC); *ABCD* is a parallelogram (opposite sides of quadrilateral *ABCD* are congruent)

PTS: 6 REF: 080938ge STA: G.G.41 TOP: Special Quadrilaterals

0110ge
Answer Section

1 ANS: 2

The length of the midsegment of a trapezoid is the average of the lengths of its bases. $\frac{x+30}{2}=44$.

$$x+30=88$$
$$x=58$$

PTS: 2 REF: 011001ge STA: G.G.40 TOP: Trapezoids

2 ANS: 1

$$x+2x+2+3x+4=180$$
$$6x+6=180$$
$$x=29$$

PTS: 2 REF: 011002ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

3 ANS: 2 PTS: 2 REF: 011003ge STA: G.G.55
TOP: Properties of Transformations

4 ANS: 2 PTS: 2 REF: 011004ge STA: G.G.17
TOP: Constructions

5 ANS: 1

The closer a chord is to the center of a circle, the longer the chord.

PTS: 2 REF: 011005ge STA: G.G.49 TOP: Chords

6 ANS: 2 PTS: 2 REF: 011006ge STA: G.G.56
TOP: Isometries

7 ANS: 3 PTS: 2 REF: 011007ge STA: G.G.31
TOP: Isosceles Triangle Theorem

8 ANS: 4

$$x^2=(4+5)\times 4$$
$$x^2=36$$
$$x=6$$

PTS: 2 REF: 011008ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: tangent and secant

9 ANS: 4 PTS: 2 REF: 011009ge STA: G.G.19
TOP: Constructions

10 ANS: 3 PTS: 2 REF: 011010ge STA: G.G.71
TOP: Equations of Circles

11 ANS: 2 PTS: 2 REF: 011011ge STA: G.G.22
TOP: Locus

12 ANS: 4 PTS: 2 REF: 011012ge STA: G.G.1
TOP: Planes

13 ANS: 1
Opposite sides of a parallelogram are congruent. $4x - 3 = x + 3$. $SV = (2) + 3 = 5$.

$$\begin{aligned} 3x &= 6 \\ x &= 2 \end{aligned}$$

PTS: 2 REF: 011013ge STA: G.G.38 TOP: Parallelograms

14 ANS: 3
$m = \frac{-A}{B} = \frac{5}{2}$. $m = \frac{-A}{B} = \frac{10}{4} = \frac{5}{2}$

PTS: 2 REF: 011014ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

15 ANS: 2
$\frac{87+35}{2} = \frac{122}{2} = 61$

PTS: 2 REF: 011015ge STA: G.G.51 TOP: Arcs Determined by Angles
KEY: inside circle

16 ANS: 1

$$\begin{aligned} a^2 + (5\sqrt{2})^2 &= (2\sqrt{15})^2 \\ a^2 + (25 \times 2) &= 4 \times 15 \\ a^2 + 50 &= 60 \\ a^2 &= 10 \\ a &= \sqrt{10} \end{aligned}$$

PTS: 2 REF: 011016ge STA: G.G.48 TOP: Pythagorean Theorem

17 ANS: 4
$d = \sqrt{(-3-1)^2 + (2-0)^2} = \sqrt{16+4} = \sqrt{20} = \sqrt{4} \cdot \sqrt{5} = 2\sqrt{5}$

PTS: 2 REF: 011017ge STA: G.G.67 TOP: Distance

18 ANS: 4
The slope of $y = -3x + 2$ is -3. The perpendicular slope is $\frac{1}{3}$. $-1 = \frac{1}{3}(3) + b$

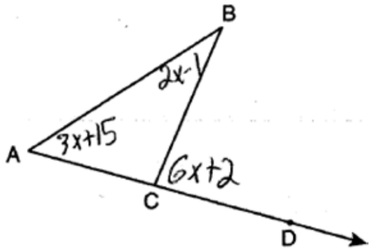
$$\begin{aligned} -1 &= 1 + b \\ b &= -2 \end{aligned}$$

PTS: 2 REF: 011018ge STA: G.G.64 TOP: Parallel and Perpendicular Lines

19 ANS: 4 PTS: 2 REF: 011019ge STA: G.G.44
TOP: Similarity Proofs

20 ANS: 2 PTS: 2 REF: 011020ge STA: G.G.74
TOP: Graphing Circles

21 ANS: 1



$$3x+15+2x-1=6x+2$$
$$5x+14=6x+2$$
$$x=12$$

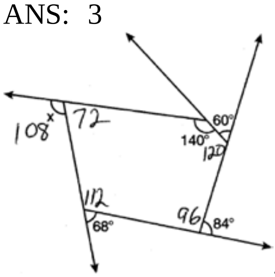
PTS: 2 REF: 011021ge STA: G.G.32 TOP: External Angle Theorem

22 ANS: 2

Because the triangles are similar, $\frac{m\angle A}{m\angle D}=1$

PTS: 2 REF: 011022ge STA: G.G.45 TOP: Similarity
KEY: perimeter and area

23 ANS: 3



. The sum of the interior angles of a pentagon is $(5-2)180=540$.

PTS: 2 REF: 011023ge STA: G.G.36 TOP: Interior and Exterior Angles of Polygons

24 ANS: 1 PTS: 2 REF: 011024ge STA: G.G.3
TOP: Planes

25 ANS: 3

$m=\frac{-A}{B}=-\frac{3}{4}$

PTS: 2 REF: 011025ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

26 ANS: 1

$A'(2,4)$

PTS: 2 REF: 011023ge STA: G.G.54 TOP: Compositions of Transformations
KEY: basic

27 ANS: 3

$V=\pi r^2h=\pi\cdot 6^2\cdot 27=972\pi$

PTS: 2 REF: 011027ge STA: G.G.14 TOP: Volume

28 ANS: 3 PTS: 2 REF: 011028ge STA: G.G.26
TOP: Inverse

29 ANS:
67. $\frac{180-46}{2}=67$

PTS: 2 REF: 011029ge STA: G.G.31 TOP: Isosceles Triangle Theorem

30 ANS:
4. $l_1w_1h_1 = l_2w_2h_2$

$10\times 2\times h = 5\times w_2 \times h$

$20 = 5w_2$

$w_2 = 4$

PTS: 2 REF: 011030ge STA: G.G.11 TOP: Volume

31 ANS:
(6,–4). $C_x = \frac{Q_x+R_x}{2}$. $C_y = \frac{Q_y+R_y}{2}$.

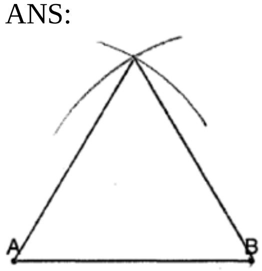
$3.5 = \frac{1+R_x}{2}$ $\quad 2 = \frac{8+R_y}{2}$

$7 = 1+R_x$ $\quad 4 = 8+R_y$

$6 = R_x$ $\quad -4 = R_y$

PTS: 2 REF: 011031ge STA: G.G.66 TOP: Midpoint

32 ANS:



PTS: 2 REF: 011032ge STA: G.G.20 TOP: Constructions

33 ANS:
5. $\frac{3}{x}=\frac{6+3}{15}$

$9x = 45$

$x = 5$

PTS: 2 REF: 011033ge STA: G.G.46 TOP: Side Splitter Theorem

34 ANS:
6. The centroid divides each median into segments whose lengths are in the ratio 2 : 1. $\overline{TD}=6$ and $\overline{DB}=3$

PTS: 2 REF: 011034ge STA: G.G.43 TOP: Centroid

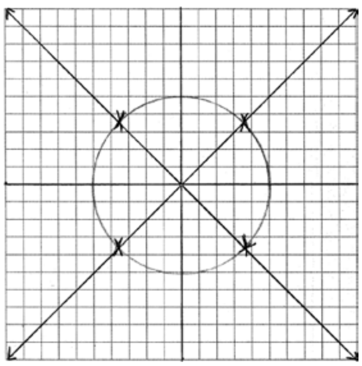
35 ANS:
36, because a dilation does not affect angle measure. 10, because a dilation does affect distance.

PTS: 4 REF: 011035ge STA: G.G.59 TOP: Properties of Transformations

36 ANS:
$\overline{JK} \cong \overline{LM}$ because opposite sides of a parallelogram are congruent. $\overline{LM} \cong \overline{LN}$ because of the Isosceles Triangle Theorem. $\overline{LM} \cong \overline{JM}$ because of the transitive property. $JKLM$ is a rhombus because all sides are congruent.

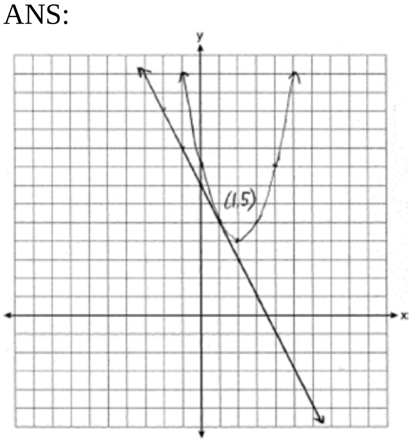
PTS: 4 REF: 011036ge STA: G.G.41 TOP: Special Quadrilaterals

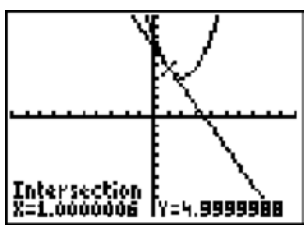
37 ANS:



PTS: 4 REF: 011037ge STA: G.G.23 TOP: Locus

38 ANS:





PTS: 6 REF: 011038ge STA: G.G.70 TOP: Quadratic-Linear Systems