1. (B) $9(7 + 3) - (2 \times 10)$

$$9(10) - 20$$
$$90 - 20$$
$$70$$

2. (C) Let C represent Carol and M represent Mark.

$$C = 5 + 2M$$

Since Mark has 2 goldfish, let $M = 2$.

Then $C = 5 + 2(2) = 9$

Carol must have 9 goldfish.

3. (A) If February 24 is on a Saturday, then seven days earlier would be Saturday February 17. Seven days earlier than that would be Saturday February 10. So February 12 must be on a Monday.

4. (A) When multiplying with like bases, we add the exponents.

$$(2^3)(2^2) = 2^5$$

5. (B) Since the cake is in a pan, the new cuts must be made from the top of the cake. If three cuts are made horizontally, parallel to cuts 1 and 2, each piece will be halved. Three is the minimum number of cuts.

6. (A) Only + substituted for □ will make both equations true.

$$b + c = c + b \text{ and } b + 0 = b$$

7. (C) Since lines are infinitely long, $\ell 5$ must cross at least two of the lines already drawn in the plane, regardless of where it is drawn in.

8. (C) The formula for area of a rectangle is A = length x width. Volume of a rectangular solid is V= length x width x height. If area = 108 and volume = 1296, the height must equal 1296 ÷ 108, or 12.

9. (D) Substitute consecutive even integer values for v, w, x, and y. Let v = 2, w = 4, x = 6 and y = 8. Then x + y = 14 and v + w = 6 and x + y is 8 greater than v + w.

10. (C) Since $\angle x = \angle y$, $\overline{AD}$ must be parallel to $\overline{BE}$ by alternate interior angles. Since $\angle y = \angle z$, $\overline{DB}$ must be parallel to $\overline{EC}$ by alternate interior angles. Since the diagram is not drawn to scale, we cannot conclude that points A, B, & C all lie on the same line.

11. (E) Since 12 kittens would need 4 cans, that leaves 6 cans for the grown cats. Each can feeds 2 grown cats, so 12 grown cats could feed on the remaining cans.

12. (B) Angles x + y form an exterior angle which is equal to the sum of the two remote interior angles.

$$x + y = 2x + x + 5$$
$$x + y = 3x + 5$$
$$\mathbf{y = 2x + 5}.$$

Or label the missing angle z, and let 2x + x + 5 + z = 180 and x + y + z = 180.

$$2x + x + 5 + z = x + y + z$$
$$3x + 5 + z = x + y + z$$
$$3x + 5 + = x + y$$
$$\mathbf{y = 2x + 5}$$

13. (D) One must notice that a 1 is carried over from the units column and a 2 is carried over from the tens column. Also, X, Y, and Z must represent different numbers. The tens column must add to 21. Z can't be 1 because then X and Y can't be larger then 9. Z could be 5, and X and Y could be 9 and 7. Z could also be 8, and X and Y could be 6 and 7.

14. (C) An increase of 10% is represented by multiplying by 1.10 (110%). A decrease of 50% is represented by multiplying by 0.50 (50%). An increase of 40% is represented by multiplying by 1.40 (140%).

$y = 1.10x$ $z = 0.50(1.10x)$ $w = 1.40(0.50(1.10x)) \rightarrow w = 0.77x$

15. (D) Substitute a value for r, such as r = 2 Let AB = BC = CD = 2.

The area of the shaded region is (area of large circle) – (area of small circle). Since Area = πr^2 then the area of large circle = $\pi(3)^2 = 9\pi$. The area of the small circle is = $\pi(2)^2 = 4\pi$. Then the area of the shaded region is $9\pi - 4\pi = 5\pi$. Now the ratio of the shaded region to the smaller circle $(5\pi) / (4\pi) = 5/4$.

16. (E) Choose an answer such that 10% of the answer is the difference between the answer and $12.60. For choice D, 10% of $14.00 is $1.40 which is the difference between $14.00 and $12.60. Taking 10% of $12.60 and adding that will NOT work.

17. (D) Angle T is a right angle. By the Pythagorean theorem, $(RT)^2 + (ST)^2 = (RS)^2$

Since RS = 12 and ST = 8, RT must equal $\sqrt{80}$

$(RT)^2 + (8)^2 = (12)^2$ $(RT)^2 + 64 = 144$ $(RT)^2 = 80$ $RT = \sqrt{80}$

The radius of the circle is $\frac{1}{2}\sqrt{80}$, so $A = \Pi r^2 \rightarrow \Pi(\frac{1}{2}\sqrt{80})^2 \rightarrow \frac{1}{4} 80\,\Pi \rightarrow 20\,\Pi$

18. (C) The perimeter of the hexagon is 6 x 22 = 132 inches.

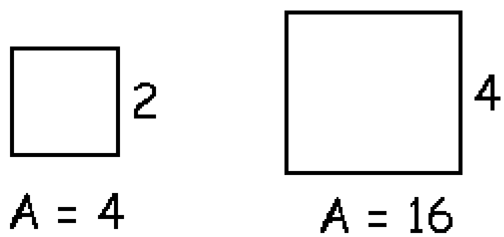
Set the circumference of the circle equal to 132. $2\,\Pi\,r = 132$

To solve for r, divide 132 by $2\,\Pi \rightarrow 132 \div 6.18 = 21.36$, which is closest to 21.

19. (B) We are not told how many games the Bombers played, but we know that the ratio of the number of games played in the 2nd year to that in the first is 2:1. Problems like these can be solved by plugging in real numbers. Let's say that there were 50 games in the first year, then they won 25 games. In the second year there were 100 games; so they won 65 games. Altogether they won 90 out of 150 games and this fraction can be lowered to 3 out of 5 or 60%.

20. (E) The reciprocal of $1\frac{1}{4}$ is $\frac{4}{5}$. $\frac{4}{5} - \frac{5}{4} = -\frac{9}{20}$.

21. (C) If each of the dimensions is doubled, the area of the new rectangle is four times the size of the original one. The increase is three times or 300%.



$$\frac{12}{4} = 3 = 300\%$$

22. (A) x yards = 3x feet; y feet = y feet; z inches = $\frac{z}{12}$ feet.

x yards + y feet + z inches = 3x feet + y feet + $\frac{z}{12}$ feet or $3x + y + \frac{z}{12}$ feet

23. (E) If the triangle is a right triangle, then the squares of the two shorter sides will add up to the square of the longest side.

The choice that doesn't work is E $12^2 + 15^2 \neq 18^2$

24. (E) By the distributive law, $26 \times 3 = 3(20 + 6) = (20 \times 3) + (6 \times 3)$.

Therefore, $26 \times 3\frac{1}{2} = (26 \times \frac{1}{2}) + (20 \times 3) + (6 \times 3)$.

25. (C) The area of the rectangle is 11″ × 8″ = 88 sq in.

The area of the triangle is $\frac{1}{2}bh$ → the triangle is $\frac{1}{2}(5)(4) = 10$ sq in.

The area of the polygon is 88 – 10 = 78 sq in.

26. (C) When variables are in a problem, substitution is almost certain to aid in finding the answer. We will substitute 1, 2, 3, and 4 in place of t, u, v, and w.

(A) $5 = 5$ true (B) $2 < 12$ true (C) $\frac{2}{12} > \frac{12}{2}$ false

(D) $\frac{1}{1} + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} = \frac{25}{12} < 3$ true (E) $3 < 8$ true

27. (D) The x-coordinate of Q is 3 more than that of P. The y-coordinate of Q is 2 less than that of P. Hence, coordinates of Q are $(3 + 3, 7 - 2) = (6, 5)$

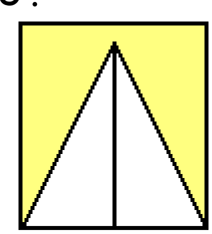
28. (D) If x is the original cost of one radio, to sell at a 25% loss means $x - 0.25x = \$120$, or $0.75x = \$120$. Thus, the original cost was \$160. The loss was \$160 – \$120 = \$40.

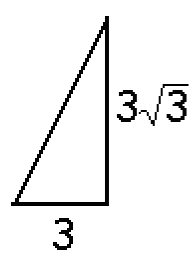
If y is the original cost of the second radio sold at a 25% gain, $y + 0.25y = \$120$ or $1.25y = \$120$. The original price was \$96. The gain was \$120 – \$96 = \$24. The total loss was \$40 – \$24 = \$16.

29. (B) The difference between the numbers increases by 2

Therefore $20 + 10 = ? = 30$.

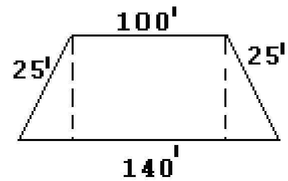
30. (B) The area of the square is 36. Since the triangle is equilateral, we can use the 30-60-90 rule to solve. By drawing an altitude find that the height of the triangle is $3\sqrt{3}$. Then the area of the triangle is $\frac{1}{2}bh = \frac{1}{2}(6)(3\sqrt{3})$. Thus the shaded area is $36 - 9\sqrt{3}$.





31. (A) $\frac{2}{5} = 0.4$. $\sqrt{0.4}$ is closest to 0.6 since $(0.6)^2 = 0.36$.

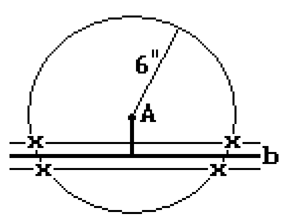
32. (D) Drawing a line from the top perpendicular to the bottom, we create a rectangle with two right triangles:



The base of each right triangle is 20′. The height of each is $\sqrt{25^2 - 20^2}$ = $\sqrt{225}$ = 15′. The area of each right triangle is $\frac{1}{2}$(20) (15) = 150 sq ft. The area of the rectangle is (15)(100) = 1500 sq ft. The total area of the face is 150 + 150 + 1500 = 1800 sq ft.

33. (E) Multiplying the equation by t, t(1 + $\frac{1}{t}$) = t($\frac{t+1}{t}$) becomes t + 1 = t + 1. Since t can be any real number, a specific value of t cannot be determined.

34. (E) Draw a circle with point A at its center and a radius of 6 inches. All points on the circle will be 6 inches from A. Draw two lines, one 1 inch above line b and the other 1 inch below line b.



The points where the circle and lines intersect are the points both 6 inches from point A and 1 inch from line b.

35. (E) Let R = 5 and S = 10, both being integers divisible by 5. But R + S = 5 + 10 = 15, which is not divisible by 10.