

Practice ACT / Solutions

1. $4 - |-4| = 4 - 4 = \boxed{0}$

2. $210 - 30 = 180 / 180 \div 45 = \boxed{4}$

3. A: $1008 \div 14 = 72$ gallons
 B: $1008 \div 36 = 28$ gallons
 $72 - 28 = \boxed{44}$ gallons

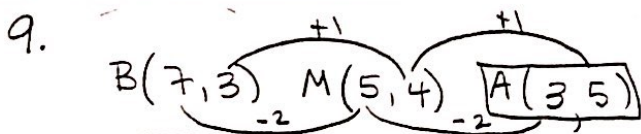
4. $t^2 - 82t^2 - 59t + 60t + 54$
 $= \boxed{-81t^2 + t + 54}$

5. BCDE is a square so all sides = 6
 ΔABE is equilateral so all sides = 6
 Perimeter (5 sides) = $5(6) = \boxed{30}$

6. $4z^2 - 8z + 3z - 6 = \boxed{4z^2 - 5z - 6}$

7. $\frac{8}{x} = .4 / x = \frac{8}{.4} = 20$
 $20(.15) = \boxed{3}$

8. $(x-2) + (x-1) + x + (x+1) + (x+2)$
 $+ (x+3) = 447$
 $6x + 3 = 447$
 $\boxed{x = 74}$



10. Sides must be perpendicular so compare slopes.
 $m_{BC} = \frac{(2-6)}{(0-6)} = -\frac{4}{3}$
 $m_{CD} = \frac{(-3-6)}{(0-6)} = \frac{3}{4}$
 $\left. \begin{matrix} m_{BC} = -\frac{4}{3} \\ m_{CD} = \frac{3}{4} \end{matrix} \right\} \perp$

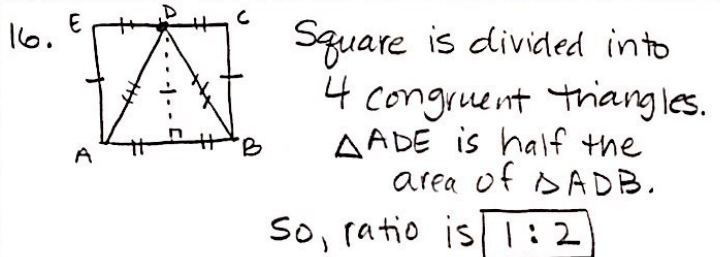
11. Store X: $100(5) + 200(10) + 150(15) = 4750$
 Store Y: $120(5) + 50(10) + 100(15) = 2600$
 Total: $4750 + 2600 = \boxed{7350}$

12. Sum of exterior angles for any polygon is 360° .

13. $30/200 = \boxed{15\%}$

14. $80/200 = .4$
 $10,000(.4) = \boxed{4000}$

15. $40/200 = .2$
 $360^\circ(.2) = \boxed{72^\circ}$



17. $m = 2/3$ (parallel lines have equal slopes)

18. If ratio is 2:3, board was divided into 5 (2+3) equal lengths...
 Short piece has 2 of those, long piece has 3 of those.
 $30 \div 5 = 6$
 Short piece = $2(6) = \boxed{12}$

19. $\sqrt{58} \approx 7.6$ $\boxed{8}$ is smallest integer greater than 7.6

20. Total Area = $4(10)(15)$ (Walls)
 $- 3(5)$ (Window)
 $- 3.5(7)$ (door)
 $\underline{560.5}$
 $\boxed{* \text{ Needs 2 cans of paint}}$

21. $x^2 + 2x - 8 = 0$
 $(x+4)(x-2) = 0$
 $x = -4, 2$

22. $\frac{2a^4}{2a^6} = \frac{a \cdot a \cdot a \cdot a}{a \cdot a \cdot a \cdot a \cdot a \cdot a} = \frac{1}{a^2}$

23. Quad II works - points are $(-x, y)$ in Quad II
Quad IV works - points are $(x, -y)$ in Quad IV

24. Cost = fixed cost + Variable cost
 $= 1400 + 5.25(b)$

25. $\frac{7.5}{3} = \frac{12.5}{AB}$ $AB = \frac{3(12.5)}{7.5} = 5$
 $\frac{7.5}{3} = \frac{15}{BC}$ $BC = \frac{15(3)}{7.5} = 6$

26. If $\frac{3\sqrt{7}}{a\sqrt{7}} = \frac{3\sqrt{7}}{7}$, then $a\sqrt{7} = 7$
 $a = \frac{7}{\sqrt{7}} \cdot \frac{\sqrt{7}}{\sqrt{7}}$
 $= \frac{7\sqrt{7}}{7} = \sqrt{7}$

27. Falling = $70 - 6s$
 Rising = $10 + 15s$
 Falling = Rising
 $70 - 6s = 10 + 15s$
 $60 = 21s$
 $\frac{60}{21} = s$ $s \approx 2.9 \text{ sec}$

28. $4 \times 2 \times 6 = 48$

* Use Fundamental Counting Principle

29. edge lengths are 4
 So Volume = $4 \times 4 \times 4 = 64$

30. $A = 10000(1 + 0.04)^5 = 12,166.53$

31. 2 circles = $2(\pi(10)^2) = 200\pi$
 Side of can is a rectangle
 rectangle = $20(2\pi(10)) = 400\pi$
 Surface Area = $200\pi + 400\pi = 600\pi$

32. $f(g(x)) = f(x^2 - 2) = 4(x^2 - 2) + 1$
 $= 4x^2 - 8 + 1 = 4x^2 - 7$

33. $0(4) + 1(10) + 2(5) + \dots = 120$
 $120/43 = 2.8$

34. $1 \neq 2$ (since they are linear pairs to $\angle x$)
 $9 \neq 10$ (since they are corresponding to $1 \rightarrow 2$)

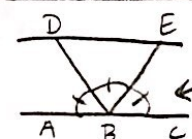
We can't say anything about angles 4-7 and 12-15 since we don't know if c is parallel to d.

35. $(3x^3)^3 = 3^3(x^3)^3 = 27x^9$

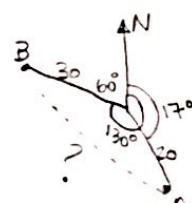
36. $4x - 8 > 8x + 16$
 $-4x > 24$
 $x < -6$

37. If rotating 90° clockwise - new point would have to be in or near QIV. Use answer choices to narrow them down. $(5, -1)$ and $(6, 0)$ most likely choices. Find slopes to see which one is \perp to radius given. $(5, -1)$

38. $10^2 + x^2 = 12^2$ / $x = \sqrt{44}$
 $\sin M = \frac{\sqrt{44}}{12}$

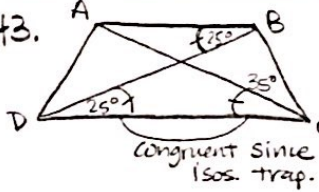
39.  Because of bisectors, all 3 angles are \cong
 $180^\circ \div 3 = 60^\circ$

40. $\frac{8 \times 10^{12}}{4 \times 10^4} = 2 \times 10^8$

41.  Use Law of Cosines -

$$\sqrt{20^2 + 30^2 - 2(20)(30)\cos 130^\circ}$$

42.
$$\frac{\frac{1}{5} + \frac{1}{15}}{2} = \frac{\frac{2}{15}}{2} = \frac{1}{15}$$

43.  $\angle ABC$ and $\angle BCD$ are Supplementary (trap.)
 $\angle ABC = 120^\circ$
 $\angle ABD = 25^\circ$ (Alt int. \angle 's)
 So $\angle DBC = 120^\circ - 25^\circ = 95^\circ$
 Congruent since isos. trap.

44. Larger square side length = $\sqrt{50} = 5\sqrt{2}$
 Smaller square side length = $\sqrt{18} = 3\sqrt{2}$
 So, $x = 5\sqrt{2} - 3\sqrt{2} = 2\sqrt{2}$

45. $\sqrt{\frac{64}{49}} = \frac{8}{7}$ so rational

46. Try some examples...
 if $a = -2$ and $b = 5$ $-(-2-5) = -(-7) = 7$
 $|a-b| = |-2-5| = |-7| = 7$
 if $a = 3$ and $b = 7$ $-(3-7) = -(-4) = 4$
 $|a-b| = |3-7| = |-4| = 4$
 $-(a-b)$

47. $x =$ sum of 5 tests
 $\frac{x}{5} = 78$ so $x = 390$
 $y =$ score on 6th test
 $\frac{390 + y}{6} = 80 \Rightarrow y = 90$

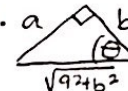
48. $(2, 1)$ - has largest horizontal distance (a) and vertical distance (b) so $\sqrt{a^2 + b^2}$ would be the greatest.

49. $8^{2x+1} = 4^{1-x}$
 $(2^3)^{2x+1} = (2^2)^{1-x}$
 $2^{6x+3} = 2^{2-2x}$
 $8x + 3 = 2 - 2x$
 $8x = -1$
 $x = -\frac{1}{8}$

50. Even (sym to y-axis)

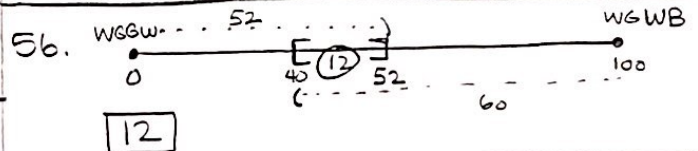
51. 19 #'s from 100-199 with at least one 0
 19 #'s from 200-299 ... etc.
 9 sets of 19 = $9(19) = 171$
 Prob = $\frac{171}{900}$ (900 #'s total from 100-999)


52. Since $\angle a$ and $\angle b$ are congruent lines have same degree of steepness just opposite directions. Slope of given lines $y = 2x + 1$ is 2
 So $m = -2$

53.  $\tan^{-1}(\frac{a}{b})$ is angle θ
 $\cos \theta = \frac{b}{\sqrt{a^2 + b^2}}$

54. $\pi(52)^2 = 8494.86$ $\boxed{8500}$

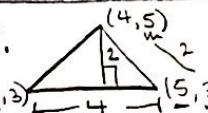
55. $C(0,0)$ $r = 52$ $x^2 + y^2 = 52^2$



57.  $1 < x < 2$ is when $x-1$ is above $(x-1)^2$

58. Try some examples...

1. $84 - 48 = 36$
 2. $36 - 63 = -27$
 3. $42 - 24 = 18$
 all multiples of 9...
 $1. 9(8-4) = 9(4) = 36 \checkmark$
 $2. 9(3-6) = 9(-3) = -27 \checkmark$
 $3. 9(4-2) = 9(2) = 18 \checkmark$
 $9(t-u)$

59.  $\frac{1}{2}bh = \frac{1}{2}(4)(2) = \boxed{4}$

60. $\frac{a}{1-.15} = 200$
 $a = 200(.85) = 170$ (first term)
 2nd term = $170(.15) = \boxed{25.5}$