

Revision

ACT · ACT · ACT

Original mixed revision, not an official enhanced ACT mock or scaled-score predictor.
Use the exact form-specific keys and field-test exclusions for official practice.

act · mixed-revision · 1

A paragraph explains a process. A proposed final sentence discusses the author's favourite holiday. Decide whether to include it and explain.

Worked answer

Omit it unless it contributes to the stated process and paragraph purpose; interesting information alone is not relevant.

act · mixed-revision · 2

A rectangular floor is 9 m by 12 m. Find its diagonal and the area.

Worked answer

15 m by the Pythagorean theorem; area 108 m^2 . Do not confuse the two units.

act · mixed-revision · 3

Trials measure 4, 7 and 10 cm of growth at fertiliser levels 0, 1 and 2. Predict at level 1.5 and identify a limitation.

Worked answer

Linear interpolation suggests 8.5 cm. The estimate assumes roughly linear behaviour between measured levels; it does not justify unlimited growth beyond the range.

act · mixed-revision · math-1

Evaluate $32^{2/5}$, multiply $(1+2i)(3-i)$, and explain why $\sqrt{x^2}$ need not equal x .

Worked answer

$32^{2/5}=4$. Product= $5+5i$. $\sqrt{x^2}=|x|$, so a negative x is not equal to its principal root.

act · mixed-revision · math-2

A displacement is (5,-12). Give its magnitude. A quantity row (4,3) and corresponding prices (2,6) produce what cost?

Worked answer

Magnitude 13; cost $4 \cdot 2 + 3 \cdot 6 = 26$. Counts and prices must use the same item order.

act · mixed-revision · math-3

Factor $x^3 - 16x$ and give all roots. Solve $(x-2)(x-6) > 0$.

Worked answer

$x(x-4)(x+4)$, roots -4,0,4. Strict inequality holds $x < 2$ or $x > 6$; endpoints excluded.

act · mixed-revision · math-4

Solve $\sqrt{x+12} = x$ and check every candidate. Is (1,3) in the region $y > 2x$ and $x+y \leq 4$?

Worked answer

Squaring gives $x^2 - x - 12 = 0$, candidates 4,-3; only 4 works. (1,3) satisfies $3 > 2$ and sum $4 \leq 4$, so it is included.

act · mixed-revision · math-5

For $f(x) = 2x - 1$ and $g(x) = x + 3$, evaluate $f(g(4))$ and $g(f(4))$. Find $f^{-1}(9)$.

Worked answer

$f(g(4)) = 13$; $g(f(4)) = 10$. $f^{-1}(x) = (x+1)/2$, so $f^{-1}(9) = 5$.

act · mixed-revision · math-6

Find the fourth term and four-term sum of 5,10,20,... . Solve $\log_3(x-2) = 2$.

Worked answer

Fourth term 40; sum 75. $x-2=9$ gives $x=11$, valid for $x > 2$.

act · mixed-revision · math-7

Give amplitude, period and maximum of $y = 5 \sin(4x) - 2$ for radian x . Find $\sin 150^\circ$.

Worked answer

Amplitude 5, period $\pi/2$, maximum 3. $\sin 150^\circ = 1/2$.

act · mixed-revision · math-8

Rotate $(-2,4)$ 90° counterclockwise about the origin. Find the midpoint and distance between $(0,-1)$ and $(6,7)$.

Worked answer

Rotation $(-4,-2)$. Midpoint $(3,3)$; distance $\sqrt{(36+64)}=10$.

act · mixed-revision · math-9

For $(x-3)^2/16+(y+1)^2/9=1$, give centre and semiaxes. A cone radius 4, height 6 has what volume?

Worked answer

Centre $(3,-1)$, semiaxes 4 horizontal and 3 vertical. Cone volume $=\pi \cdot 16 \cdot 6/3=32\pi$.

act · mixed-revision · math-10

A normal model has mean 80 and SD 6. Give the approximate 68% interval. Observed value 31 with predicted 34 has what residual?

Worked answer

Approximately 74–86. Residual $31-34=-3$; a prediction error alone does not explain causation.

act · mixed-revision · math-11

Choose an ordered leader/deputy pair and an unordered two-person team from seven people. How many possibilities of each? A prize 12 has probability $1/4$; otherwise the prize is zero. Find expected prize.

Worked answer

Ordered $7 \cdot 6=42$; unordered 21. Expected prize $=12 \cdot 1/4=3$.

act · mixed-revision · math-12

A hire model $C=9+2t$ predicts 15 for three hours. Every observed bill is four units higher at several durations. Propose a revision. Convert a 2.5 m length to centimetres and to its length on a 1:50 plan.

Worked answer

$C=13+2t$ adjusts the constant offset while retaining slope. 2.5 m $=250$ cm; at 1:50 the drawing length is 5 cm.

act · mixed-revision · task-19

An argument proposes wider aisles to improve wheelchair access. Choose a useful addition: measured aisle widths or a history of the shop's logo. Explain one limit on what the widths establish.

Worked answer

Widths directly address access; logo history does not. Widths alone do not establish usability at every turn or during crowded periods.

act · mixed-revision · task-20

Order A “These entries were then checked against receipts.” B “The clerk listed each payment.” C “Discrepancies were marked for review.” Choose a transition from the check to the discrepancies and explain.

Worked answer

B–A–C. These entries requires the list. A sequence or result expression can fit depending on sentence wording; a contrast is unsupported.

act · mixed-revision · task-21

Edit “During the first week, workers returned back approximately around noon. This epic result proves the schedule always works.” Keep all defensible information.

Worked answer

During the first week, workers returned approximately at noon. Remove back and one approximating expression; delete the unsupported universal claim and exaggerated judgement.

act · mixed-revision · task-22

Repair “Although the readings were stable. The set of measurements were incomplete, reviewing them, a missing value worried Al.” Explain the real subject.

Worked answer

For example: Although the readings were stable, the set of measurements was incomplete. Reviewing them, Al noticed a missing value. Set is singular; Al reviews the readings.

act · mixed-revision · task-23

A narrator says “The first trial was slow. After we labelled the drawers, two visitors found their tools without asking. We have not tried the system on a busy day.” State a supported inference and a limit.

Worked answer

Labels may have helped those two visitors retrieve tools; busy-day performance remains untested. Do not infer universal efficiency or causation proved by this small observation.

act · mixed-revision · task-24

“The repair breathed new life into the hall. Yet one corner stayed unused.” Explain the figurative phrase and the function of Yet.

Worked answer

Breathed new life means restored activity or usefulness, not literal breathing. Yet introduces a limitation on the apparent success.

act · mixed-revision · task-25

Author A wants longer hours; B agrees that access matters but asks for staffing evidence first. Visits/waiting counts are daytime 40/8 and evening 15/6. Compare views and waiting proportions.

Worked answer

Shared goal: access. Disagreement: immediate expansion versus evidence before staffing changes. Rates 20% and 40%; fewer evening visitors does not mean a smaller proportion waited.

act · mixed-revision · task-26

Two sensors differ in housing material and ventilation. Temperature differs. Design a test of ventilation alone; choose a design meeting cost ≤ 8 and error ≤ 2 from A (7,2), B (5,3), C (9,1).

Worked answer

Keep housing material and other conditions fixed while varying ventilation, with repeats. A satisfies both; B fails error and C fails cost.

act · mixed-revision · task-27

Models P and Q both predict a fall in output with time; only Q predicts a further fall with increasing humidity at fixed time. What test separates them? What does a shared prediction prove?

Worked answer

Use matched devices at different humidities with runtime and measurement conditions fixed. A fall with time alone cannot discriminate between the models.

act · mixed-revision · task-28

At times 0, 2, 4 min, output is 10, 18, 22 units. Interpolate at 3 min. Compare interval rates and assess extending the first rate to minute 4.

Worked answer

Interpolated output 20. Rates 4 and 2 units/min. First rate predicts 26 at minute 4, contradicting measured 22; constant rate across the full interval is unsupported.

act · mixed-revision · task-6

For the learning-centre booking issue, draft a relationship statement and one developed reason for your own position. Then annotate which of the four writing domains each revision would improve.

Worked answer

Accept a clear relationship to a supplied perspective and a developed example with an explained implication. Label changes by analysis, development/support, organisation or language; no stance-based grading or official score prediction.